

# A BIBLIOGRAPHY OF THE CONODONTS WITH DESCRIPTIONS OF EARLY MISSISSIPPIAN SPECIES

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## INTRODUCTION

The present contributions to the study of the conodonts was prepared at the suggestion of Dr. R. S. Bassler and under his direction in the paleontological laboratory of the United States National Museum where extensive collections of these toothlike structures were available. As Doctors Ulrich and Bassler had just completed their paper on the classification of the conodonts and had applied their new classification in the description of an Upper Devonian fauna of western New York and an early Mississippian one from Tennessee, it was thought best that my work should carry these studies to the Mississippian rocks of Alabama and also include for the ready reference by students illustrations of previously described species, with exception of three publications, and a bibliography of the group. The exceptions mentioned refer to the work of Bryant in 1921, Ulrich and Bassler in 1926, and Roundy in 1926, copies of which are still available to the student.

## ZOOLOGICAL AFFINITIES OF THE CONODONTS

The affinities of the conodonts have been a subject of controversy almost since their discovery by Pander in 1856. That there was no doubt in Pander's mind as to their relationship may be ascertained from the title of his monograph. He studied the internal as well as the external structure of the fossils and saw in their formation fishlike characters somewhat of the Selachian type.

The question concerning the affinities of these fossils seems to have had its birth in the mind of Dr. J. S. Newberry, of Ohio, who after studying specimens found in the Cleveland shales remained undecided for some years whether they were Marsipobranchii (Cyclostomata) or Annelids.

Hinde, who made the most comprehensive study of conodonts of any paleontologist up to Bryant's work of 1921, classified them as primitive vertebrates, probably Myxinoids. He based his conclusions upon two facts: First, no gastropods which possessed such

teeth were found in the same formations nor did any crustaceans have such spines; and, secondly, the annelid jaws which he found in the same beds are composed of chitin, while the conodont teeth contain both calcium carbonate and calcium phosphate. He was of the same opinion in 1900, namely, that the teeth belonged to fish rather than to some invertebrate.

In 1886 Rohon and Zittel decided that "the conodonts have structurally nothing in common either with the dentine of Selachia and other fishes, the horny teeth of Cyclostomi, the lingual teeth of the Mollusca, the hooklets of the Cephalopoda, or the broken segment spines of the Crustacea; on the other hand, both in form and in structure, they agree remarkably with the masticatory apparatus of the Annelida and Gephyrea." They came to the conclusion that since there is this agreement, all these microscopic teeth, those acknowledged by Hinde to be annelids and those which he called conodonts, are the oral or oesophageal teeth of worms.

In reviewing the literature on conodonts it will be found that the most thorough students of these fossils believe they are the remains of primitive vertebrates, probably some simple fish. In neither of John Smith's papers on conodonts of Scotland can one find a suggestion that these are not fish teeth, but an exception is found when Asser Hadding places them in the phylum Annelida.

In Grabau's Text-Book of Geology, conodonts are described as horny, jawlike, or toothed structures developed within the body—the oesophageal jaws of worms.

Bryant in 1921 remarks: "On the whole, the longer I have studied these organisms the more have I become convinced that the true conodonts have hardly anything really diagnostic in common with annelid jaws. If, as I shall hereinafter try to demonstrate, certain of the leaflike forms are of the nature of pavement teeth, then the conclusion seems almost unavoidable that the conodonts must be considered as the dentition of some primitive type of fishes."

In the recent publication on the subject of conodonts by Ulrich and Bassler they are regarded as teeth and plates of primitive fish. Their classification is as follows:

## Class PISCES

### TYPICAL CONODONTS (teeth of primitive fishes)

#### Family DISTACODIDAE Ulrich and Bassler

*Distacodus* Hinde, 1879 (*Machairodus* Pander, 1856, preoccupied; *Machairodia* Smith, 1907); *Acodus* Pander, 1856; *Acontiodus* Pander, 1856; *Drepanodus* Pander, 1856; *Scolopodus* Pander, 1856; *Oistodus* Pander, 1856; *Paltodus* Pander, 1856.

## Family PRIONIODIDAE Ulrich and Bassler

*Prioniodus* Pander, 1856; *Subprioniodus* Smith, 1907; *Cordylodus* Pander, 1856; *Belodus* Pander, 1856; *Ligonodina*, Ulrich and Bassler.

## Family PRIONIODINIDAE Ulrich and Bassler

*Cornuramia* Smith, 1907; *Hindeodella*, Ulrich and Bassler; *Pachysomia* Smith, 1907; *Lonchodina*, Ulrich and Bassler; *Prioniodina*, Ulrich and Bassler; *Prioniodella*, Ulrich and Bassler; *Bryantodus*, Ulrich and Bassler; *Euprioniodina*, Ulrich and Bassler; *Hibbardella*, Ulrich and Bassler; *Lonchodus* Pander, 1856; *Valentia* Smith, 1907; *Prionognathus* Pander, 1856; *Palmatodella*, Ulrich and Bassler; *Diplododella*, Ulrich and Bassler; *Synprioniodina*, Ulrich and Bassler.

## FISH PLATES (dermal plates)

## Family POLYGNATHIDAE Ulrich and Bassler

*Polygnathus* (Hinde) Bryant, 1921; *Ancyrodella* Ulrich and Bassler; *Palmatolepis* Ulrich and Bassler; *Panderodella* Ulrich and Bassler; *Polygnathellus* Ulrich and Bassler; *Gnathodus* Pander, 1856; *Ctenognathus* Pander, 1856.

## BIBLIOGRAPHY OF CONODONT LITERATURE

1856. PANDER, C. H., Monographie der Fossilen Fische des Silurischen Systems der Russisch-Baltischen Gouvernements, St. Petersburg, 91 pages, 9 plates. (Contains original definition of conodonts with description of numerous genera and species.)
1861. HARLEY, J., Geological Society, London, Quarterly Journal, volume 17, pages 543-552, plate 17. (Discusses zoological position. Probably several of his specimens described are not conodonts.)
1861. OWEN, RICHARD, Paleontology, Second Edition, Edinburgh, page 117. (Brief discussion of position.)
1863. VON EICHWALD, C. E., Bulletin de la Societe Imperiale des Naturalistes de Moscou, volume 36, page 375. (Brief discussion of systematic position.)
1870. MOORE, CHARLES, British Association for the Advancement of Science. Report of the 39th Meeting, 1869, pages 375-377. (Conodonts discussed but no specific description or figures.)
1875. NEWBERRY, J. S., Geological Survey, Ohio, Report, volume 2, part 2, Paleontology, pages 41-44, plate 57. (Illustrates various specimens without generic or specific names and discusses systematic position.)
1878. ULRICH, E. O., Journal Cincinnati Society of Natural History, volume 1, pages 87-91, plate 4. (Briefly discusses conodonts.)
1879. HINDE, G. J. Quarterly Journal, Geological Society, London, volume 35, pages 351-369, plates 15-17. (A general review of conodonts, with discussion of zoological relations and description of new forms.)

1880. YOUNG, JOHN, Glasgow Natural History Society, Proceedings, volume 4, pages 5 and 74. (Notice of occurrence of conodonts in Silurian and Devonian strata in England.)
1881. MASON, ROBERT, Glasgow Natural History Society, Proceedings, volume 4, page 190. (Records discovery of conodonts at a new locality in Scotland.)
1882. ROLLE, FR., Handwörterbuch der Mineralogie, Geologie, und Paleontologie, volume 1, page 408. (Short discussion.)
1884. JAMES, U. P., Cincinnati Society Natural History Journal, volume 7, pages 143-149, plate 7. (Describes two conodonts.)
1886. ROHON J. V., and ZITTEL, V., Sitzungsberichte der mathematische-physikalischen Classe der k. Akademie der Wissenschaften zu München, volume 16, pages 108-136, plates 1, 2. (Discussion of zoological position from a chemical and physical standpoint.)
1887. CLARKE, J. M., New York State Geologist, Sixth Annual Report for 1886, pages 30-33, plate A1. (Description and figures of conodonts and annelid jaws from the Devonian of New York.)
1898. GIRTY, GEORGE H., American Journal of Science, series 4, volume 6, pages 384-395. (Describes and illustrates a species from the Upper Devonian of Kentucky.)
1899. GRABAU, A. W., Bulletin Buffalo Society Natural Sciences, volume 6, pages 150-158. (Reproduces Hinde's figures with condensed descriptions.)
1900. SMITH, JOHN, Natural History Society, Glasgow, Transactions, new series, volume 5, pages 336-338. (Discusses occurrence of Scotch Carboniferous conodonts.)
1900. HINDE, G. J., Natural History Society, Glasgow, Transactions, new series, volume 5, pages 338-346, plates 9, 10. (Describes and figures 13 species of Scotch Carboniferous conodonts.)
1907. SMITH, JOHN, Natural History Society, Glasgow, Transactions, new series, volume 7, part 3, pages 235-252, plates 5-9. (Discusses occurrence of conodonts in Silurian rocks of Scotland and describes about 40 species and 4 new genera.)
1910. GRABAU, A. W., and SHIMER, H. W., North American Index Fossils, Invertebrates, volume 2, pages 243-245. (Conodonts of Genesee, Waverly, Chazy, and Lorraine listed. Figures copied from Hinde.)
1913. HADDING, ASSAR, Lunds University Arsskrift, new series, volume 9, No. 15. Kongl. Fysiografiske Sällskapet Handlingar, new series, volume 24, No. 15, pages 30-32. (Describes eight new species of conodonts.)
1921. BRYANT, WILLIAM L., Buffalo Society Natural Science Bulletin, volume 13, No. 2, pages 1-58, plates 1-16. (Reviews the literature and discusses zoological position of conodonts. (Describes fauna of Genundewa limestone of western New York.)
1921. GRABAU, AMADEUS W., A Textbook of Geology, Part 2, Historical Geology, pages 140 and 584. (Notes occurrence of conodonts in Upper Ordovician and Upper Devonian. Mentions probable zoological position.)
1923. PARKS, W. A., assisted by Madeline Fritz. The Stratigraphy and Paleontology of Toronto and vicinity. part 3, Gastropods, Cephalopods, and Vermes. Thirty-first Annual Report, Ontario, Department of Mines, volume 31, part 9, pages 1-45, plates 1-6. (Hinde's work on annelids and conodonts of Toronto region copied.)
1923. DEAN, BASHFORD A., Bibliography of Fishes, volume 3, American Museum on Natural History. (Mentions that the zoological position of conodonts is disputed.)

1924. CLARK, THOMAS H., Bulletin American Paleontology, volume 10, No. 41, pages 67-70, plate 6. (Describes seven supposed species of conodonts.)
1925. ROUNDY, P. V., Bibliography of Conodont and Paleozoic annelid jaw literature, 4 pages. (Mimeographed; distributed by the Division of Geology and Geography, National Research Council, Washington, D. C.)
1926. ULRICH E. O. and BASSLER R. S., A classification of the tooth-like fossils conodonts, with descriptions of American Devonian and Mississippian species. Proceedings U. S. National Museum, volume 68, pages 1-63, plates 1-11. (Digest of classification in Bulletin Geological Society of America, 1925, vol. 36, pp. 218-220.)
1926. ROUNDY, P. V. The microfauna in Mississippian Formations of San Saba County, Texas. Professional Paper 146, U. S. Geological Survey, pages 5-17 plates 1-4. (Describes 10 species and varieties of conodonts, seven of which are new.)
1926. BUTTS, CHARLES. Geology of Alabama. Geological Survey of Alabama, Special Rept. No. 14, plate 48. (Gives illustrations of sixteen species figured in the present article.)

## BIBLIOGRAPHIC LIST OF CONODONTS

In this condensed bibliographic list of conodonts only the page and plate citations are given since the title of the work can be determined from the foregoing bibliography of literature. For the proper generic references, I have followed the work of Ulrich and Bassler.

- Acodus* PANDER, 1856 (p. 21). Genotype (first species): *Acodus erectus* Pander, 1856.
- Acodus acutus* PANDER, 1856 (p. 21, pl. 1, fig. 12). Lower Ordovician, Baltic Provinces.
- Acodus crassus* PANDER, 1856 (p. 22, pl. 1, fig. 10; pl. 2, fig. 13). Lower Ordovician, Baltic Provinces.
- Acodus erectus* PANDER, 1856 (p. 21, pl. 1, fig. 1). Lower Ordovician, Baltic Provinces.
- Acodus planus* PANDER, 1856 (p. 22, pl. 1, fig. 9). Lower Ordovician, Baltic Provinces.
- Acodus sigmoideus* PANDER, 1856 (p. 21, pl. 1, fig. 11). Lower Ordovician, Baltic Provinces.
- Acontiodus* PANDER, 1856 (p. 28). Genotype (first species): *Acontiodus latus* Pander, 1856.
- Acontiodus gracilis* PANDER, 1856 (p. 28, pl. 2, figs. 2a-c). Lower Ordovician, Baltic Provinces.
- Acontiodus latus* PANDER, 1856 (p. 28, pl. 2, figs. 1a-c). Lower Ordovician, Baltic Provinces.
- Acontiodus triangularis* PANDER, 1856 (p. 28, pl. 2, figs. 35a-d). (*Acontiodus triangulosis* on plate). Lower Ordovician, Baltic Provinces.
- Ancyrodella* ULRICH and BASSLER, 1926 (p. 48). Genotype: *Ancyrodella nodosa* ULRICH and BASSLER, 1926.
- Ancyrodella hamata* ULRICH and BASSLER, 1926 (p. 48, pl. 7, fig. 7). Mississippian, Hardin sandstone at base of Chattanooga shale, Mount Pleasant, Tenn.
- Ancyrodella malleus* ULRICH and BASSLER, 1926 (p. 49, pl. 7, figs. 1, 2). Mississippian, Hardin sandstone at base of Chattanooga shale, Mount Pleasant, Tenn.

- Ancyrodella nodosa* ULRICH and BASSLER, 1926 (p. 48, pl. 1, figs. 10-13). Devonian, Rhinestreet shale of the Portage group, Shaleton, Erie County, N. Y.
- Ancyrodella symmetrica* ULRICH and BASSLER, 1926 (p. 49, pl. 8, fig. 1). Mississippian, Hardin sandstone at base of Chattanooga shale, Mount Pleasant, Tenn.
- Belodus* PANDER, 1856 (p. 30). Genotype and only species: *Belodus gracilis*, Pander, 1856.
- Belodus gracilis* PANDER, 1856 (p. 30, pl. 2, fig. 21). Lower Ordovician, Baltic Provinces.
- Bryantodus* ULRICH and BASSLER, 1926 (p. 21). Genotype: *Bryantodus typicus* ULRICH and BASSLER, 1926.
- Bryantodus coalescens* ULRICH and BASSLER, 1926 (p. 25, pl. 4, fig. 28). Upper Devonian, Rhinestreet shale of Portage group, Shaleton, Erie County, N. Y.
- Bryantodus conjunctus* ULRICH and BASSLER, 1926 (p. 24, pl. 4, figs. 8, 9). Upper Devonian, Rhinestreet shale of Portage group, Shaleton, Erie County, N. Y.
- Bryantodus crassidens* ULRICH and BASSLER, 1926 (p. 23, pl. 6, figs. 17, 18). Upper Devonian, Rhinestreet shale of Portage group, Shaleton, Erie County, N. Y.
- Bryantodus crassus* ULRICH and BASSLER, 1926 (p. 27, pl. 10, fig. 14). Mississippian, Hardin sandstone at base of Chattanooga shale, Mount Pleasant, Tenn.
- Bryantodus cristatus* BRYANT, 1921. *Prioniodus cristatus* BRYANT, 1921 (p. 20, pl. 3, fig. 9; pl. 6, fig. 7). Upper Devonian, Genundewa limestone at base of Genesee, North Evans, Eighteen Mile Creek, N. Y.
- Bryantodus curvatulus* ULRICH and BASSLER, 1926 (p. 28, pl. 9, fig. 13). Mississippian, Hardin sandstone at base of Chattanooga shale, Mount Pleasant, Tenn.
- Bryantodus curvatus* ULRICH and BASSLER, 1926 (p. 26, pl. 4, figs. 19, 20). Upper Devonian, Rhinestreet shale of Portage group, Shaleton, Erie County, N. Y.
- Bryantodus dubius* SMITH, 1900. *Polygnathus dubius* SMITH, 1900. (Not Hinde, 1879), (p. 341, pl. 9, fig. 1). Carboniferous, Lower limestone, Birkhead, etc., west Scotland.
- Bryantodus duplicatus* HINDE, 1879. *Polygnathus duplicatus* HINDE, 1879 (p. 364, pl. 16, fig. 19). "Genesee, Bear Creek, Ontario."
- Bryantodus germanus* ULRICH and BASSLER, 1926 (p. 25, pl. 10, fig. 18). Mississippian, Hardin sandstone at base of Chattanooga shale, Mount Pleasant, Tenn.
- Bryantodus gracilis* ULRICH and BASSLER, 1926 (p. 27, pl. 10, fig. 10). Mississippian, Hardin sandstone at base of Chattanooga shale, Mount Pleasant, Tenn.
- Bryantodus immersus* HINDE, 1879, *Polygnathus immersus* HINDE, 1879 (p. 364, pl. 16, fig. 21). *Prioniodus immersus* BRYANT, 1921 (p. 19, pl. 6, fig. 2). "Genesee, Kettle Point, Ontario." Reported by Bryant from the Genundewa limestone.
- Bryantodus incertus* ULRICH and BASSLER, 1926 (p. 27, pl. 10, fig. 8). Mississippian, Hardin sandstone at base of Chattanooga shale, Mount Pleasant, Tenn.
- Bryantodus inequalis* ULRICH and BASSLER, 1926 (p. 22, pl. 6, fig. 14). Upper Devonian, Rhinestreet shale of the Portage group, Shaleton, Erie County, N. Y.
- Bryantodus insolens* ULRICH and BASSLER, 1926 (p. 25, pl. 10, fig. 17). Mississippian, Hardin sandstone at base of Chattanooga shale, Mount Pleasant, Tenn.

- Bryantodus macrodentatus* BRYANT, 1921, *Prioniodus macrodentatus* BRYANT, 1921 (p. 18, pl. 8, fig. 10). Upper Devonian, Genundewa limestone at base of Genesee, North Evans, Eighteen Mile Creek, N. Y.
- Bryantodus minutus* ULRICH and BASSLER, 1926 (p. 27, pl. 10, fig. 6). Mississippian, Hardin sandstone at base of Chattanooga shale, Mount Pleasant, Tenn.
- Bryantodus multidentis* ULRICH and BASSLER, 1926 (p. 22, pl. 6, figs. 15, 16). Upper Devonian, Rhinestreet shale of the Portage group, Shaletton, Erie County, N. Y.
- Bryantodus muricatus* BRYANT, 1921, *Prioniodus muricatus* BRYANT, 1921 (p. 18, pl. 5, fig. 7). Upper Devonian, Genundewa limestone at base of Genesee, North Evans, Eighteen Mile Creek, N. Y.
- Bryantodus nelsoni* ULRICH and BASSLER, 1926 (p. 28, pl. 10, fig. 9). Mississippian, Hardin sandstone at base of Chattanooga shale, Mount Pleasant, Tenn.
- Bryantodus nitidus* ULRICH and BASSLER, 1926 (p. 24, pl. 4, figs. 12-14). Upper Devonian, Rhinestreet shale of Portage group, Shaletton, Erie County, N. Y.
- Bryantodus normalis* ULRICH and BASSLER, 1926 (p. 24, pl. 4, figs. 25-27). Upper Devonian, Rhinestreet shale of the Portage group, Shaletton, Erie County, N. Y.
- Bryantodus obliquus* ULRICH and BASSLER, 1926 (p. 23, pl. 6, figs. 19, 21). Upper Devonian, Rhinestreet shale of the Portage group, Shaletton, Erie County, N. Y.
- Bryantodus obtusus* BRYANT, 1921, *Prioniodus obtusus* BRYANT, 1921 (p. 20, pl. 3, fig. 6, pl. 6, fig. 1). Upper Devonian, Genundewa limestone at base of Genesee, North Evans, Eighteen Mile Creek, N. Y.
- Bryantodus parvulus* BRYANT, 1921, *Prioniodus parvulus* BRYANT, 1921 (p. 20, pl. 9). Upper Devonian, Genundewa limestone at base of Genesee, North Evans, Eighteen Mile Creek, N. Y.
- Bryantodus pergracilis* ULRICH and BASSLER, 1926 (p. 27, pl. 10, fig. 11). Mississippian, Hardin sandstone at base of Chattanooga shale, Mount Pleasant, Tenn.
- Bryantodus politus* HINDE, 1879, *Prioniodus politus* HINDE, 1879 (p. 358, pl. 15, figs. 11, 12); Parks, 1922 (p. 37, pl. 6, figs. 26, 27). Upper Cincinnati, Lorraine-Dundas, Garrison Common, Ontario.
- Bryantodus pravus* BRYANT, 1921, *Prioniodus pravus* BRYANT, 1921 (p. 18, pl. 8, fig. 5). Upper Devonian, Genundewa limestone at base of Genesee, North Evans, Eighteen Mile Creek, N. Y.
- Bryantodus radiatus* HINDE, 1879, *Polygnathus radiatus* HINDE, 1879, (p. 364, pl. 16, fig. 20). *Prioniodus radiatus* BRYANT, 1921 (p. 16, pl. 4, figs. 10-12; pl. 5, figs. 1-5, 8; pl. 6, fig. 5; pl. 7, figs. 1, 2, 4, 6, 8; pl. 14, fig. 1). "Genesee, Kettle Point, Ontario". Identified by Bryant from Genundewa limestone of western New York.
- Bryantodus retusus* BRYANT, 1921, *Prioniodus retusus* BRYANT, 1921 (p. 17, pl. 4, figs. 8, 9; pl. 5, figs. 9, 11; pl. 8, fig. 3). Upper Devonian, Genundewa limestone at base of Genesee, North Evans, Eighteen Mile Creek, N. Y.
- Bryantodus semiseparatus* ULRICH and BASSLER, 1926 (p. 24, pl. 4, fig. 16). Upper Devonian, Rhinestreet shale of the Portage group, Shaletton, Erie County, N. Y.
- Bryantodus sinuatus*, ULRICH and BASSLER, 1926 (p. 23, pl. 6, figs. 22-24). Upper Devonian, Rhinestreet shale of the Portage group, Shaletton, Erie County, N. Y.
- Bryantodus spatulatus* BRYANT, 1921, *Prioniodus spatulatus* BRYANT, 1921 (p. 18, pl. 8, fig. 9). Upper Devonian, Genundewa limestone at base of Genesee, North Evans, Eighteen Mile Creek, N. Y.

- Bryantodus subbrevis* ULRICH and BASSLER, 1926 (p. 28, pl. 10, figs. 15, 16). Mississippian, Hardin sandstone at base of Chattanooga shale, Mount Pleasant, Tenn.
- Bryantodus subradiatus* ULRICH and BASSLER, 1926 (p. 26, pl. 10, figs. 12, 13). Mississippian, Hardin sandstone at base of Chattanooga shale, Mount Pleasant, Tenn.
- Bryantodus tenuis* ULRICH and BASSLER, 1926 (p. 26, pl. 10, fig. 7). Mississippian, Hardin sandstone at base of Chattanooga shale, Mount Pleasant, Tenn.
- Bryantodus transitens* ULRICH and BASSLER, 1926 (p. 26, pl. 4, figs. 10, 11). Upper Devonian, Rhinestreet shale of the Portage group, Shaleton, Erie County, N. Y.
- Bryantodus tridentatus* ULRICH and BASSLER, 1926 (p. 22, pl. 6, fig. 13). Upper Devonian, Rhinestreet shale of Portage group, Shaleton, Erie County, N. Y.
- Bryantodus typicus* ULRICH and BASSLER, 1926 (p. 21, figs. 11, 12). Upper Devonian, Rhinestreet shale of Portage group, Shaleton, Erie County, N. Y.
- Centrodus* PANDER, 1856. See *Lonchodus* PANDER, 1856.
- Centrodus convexus* PANDER, 1856. See *Lonchodus convexus*.
- Centrodus distans* SMITH, 1907. See *Lonchodus distans*.
- Centrodus duplicatus* HINDE, 1900. See *Hindeodella duplicata*.
- Centrodus erectus* SMITH, 1907. See *Lonchodus erectus*.
- Centrodus invalidus* BRYANT, 1921. See *Prioniodella invalida*.
- Centrodus lineatus* HINDE, 1900. See *Hindeodella lineata*.
- Centrodus obliquus* SMITH, 1907. See *Lonchodus obliquus*.
- Centrodus princeps* BRYANT, 1921. See *Lonchodus princeps*.
- Centrodus simplex* PANDER, 1856. See *Lonchodus simplex*.
- Cordylodus* PANDER, 1856 (p. 33). Genotype (first species): *Cordylodus angulatus* PANDER, 1856.
- Cordylodus angulatus* PANDER, 1856 (p. 33, pl. 2, figs. 26-31, 34). Lower Ordovician, Baltic Provinces.
- Cordylodus ramosus* HADDING, 1913 (p. 31, pl. 1, fig. 6). Ordovician Dicellograptus zone, southern Norway.
- Cordylodus rotundatus* PANDER, 1856 (p. 33, pl. 2, figs. 32, 33). Lower Ordovician, Baltic Provinces.
- Cornuramia* SMITH, 1907 (p. 246); ULRICH and BASSLER, 1926 (p. 41). Genotype: *Cornuramia monodonta* SMITH, 1907.
- Cornuramia bicornua* SMITH, 1907 (p. 251, pl. 9, fig. 49). Ordovician, Arenig-Llandeilo, southern uplands of Scotland.
- Cornuramia diplodonta* SMITH, 1907 (p. 246, pl. 5, fig. 25). Ordovician, Arenig-Llandeilo, Ravengill, Scotland.
- Cornuramia monodonta* SMITH, 1907 (p. 246, pl. 6, fig. 20). Ordovician, Arenig-Llandeilo, Ravengill, etc., Scotland.
- Ctenognathus* PANDER, (1856, p. 32); ULRICH and BASSLER, 1926 (p. 54) ROUNDY, 1926 (p. 16). Genotype: *Ctenognathus murchisoni* PANDER, 1856.
- Ctenognathus kayserlingii* PANDER, 1856 (p. 32, pl. 2A, fig. 15). Carboniferous limestone, Tula, Russia.
- Ctenognathus murchisoni* PANDER, 1856 (p. 32, pl. 4, fig. 17; pl. 6, figs. 18a, b). Silurian, Rootsikille, Russia.
- Ctenognathus obliquus* PANDER, 1856. See *Hindeodella obliqua*.
- Ctenognathus verneuilli* PANDER, 1856 (p. 32, pl. 4, fig. 18; pl. 2A, figs. 13, 14, 16, 17). Devonian, Wells on the Wolchow, Russia. Species of *Valentia*, *Prioniodina*, and *Hindeodella* are represented by these illustrations.

- Diplododella* ULRICH and BASSLER, 1926 (p. 41). Genotype: *Diplododella bilateralis* ULRICH and BASSLER, 1926.
- Diplododella bilateralis* ULRICH and BASSLER, 1926 (p. 41, text fig. 21, p. 16). Mississippian, Hardin sandstone at base of Chattanooga shale, Mount Pleasant, Tenn.
- Distacodidae* ULRICH and BASSLER, 1926 (p. 6).
- Distacodus* HINDE, 1879 (p. 357). Proposed for *Machairodus* PANDER, 1856 (p. 22) preoccupied. *Machairodia* SMITH, 1907 (p. 246), also proposed in place of *Machairodus* PANDER. Genotype: *Distacodus* (*Machairodus*) *incurvus* PANDER, 1856.
- Distacodus angustus* PANDER, 1856. *Machairodus angustus* PANDER, 1856 (p. 23, pl. 1, fig. 35). Lower Ordovician, Baltic Provinces.
- Distacodus canaliculatus* PANDER, 1856. *Machairodus canaliculatus* PANDER, 1856 (p. 24, pl. 1, fig. 23). Lower Ordovician, Baltic Provinces.
- Distacodus dilatatus* PANDER, 1856. *Machairodus dilatatus* PANDER, 1856 (p. 22, pl. 1, fig. 14; pl. 2, fig. 14). Lower Ordovician, Baltic Provinces.
- Distacodus ensiformis* PANDER, 1856. *Machairodus ensiformis* PANDER, 1856 (p. 23, pl. 1, figs. 25–28; pl. 2, fig. 36). Lower Ordovician, Baltic Provinces.
- Distacodus inaequalis* PANDER, 1856. *Machairodus inaequalis* PANDER, 1856 (p. 23, pl. 2, fig. 38). Lower Ordovician, Baltic Provinces.
- Distacodus incurvus* PANDER, 1856. *Machairodus incurvus* PANDER, 1856 (p. 23, pl. 1, fig. 22). Lower Ordovician, Baltic Provinces; HINDE, 1879 (p. 357, pl. 15, fig. 9), and PARKS, 1922 (p. 36, pl. 6, fig. 23). Upper Ordovician, Lorraine-Dundas, Garrison Common near Toronto, Ontario.
- Distacodus planus* PANDER, 1856. *Machairodus planus* PANDER, 1856 (p. 24, pl. 2, fig. 39). Lower Ordovician, Baltic Provinces.
- Distacodus rectus* ULRICH and BASSLER, 1926 (p. 6, pl. 9, fig. 22). Mississippian, Hardin sandstone at base of Chattanooga shale, Mount Pleasant, Tenn.
- Distacodus rhombus* SMITH, 1907. *Machairodia rhombus* (Pander ?) SMITH, 1907 (p. 246, pl. 6, fig. 19). Ordovician, Arenig-Llandeilo, Ravengill, etc., southern uplands of Scotland.
- Distacodus rhomboideus* PANDER, 1856. *Machairodus rhomboideus* PANDER, 1856 (p. 22, pl. 2, figs. 10–12). Lower Ordovician, Baltic Provinces.
- Distacodus solidus* PANDER, 1856. *Machairodus solidus* PANDER, 1856 (p. 23, pl. 2, fig. 15). Lower Ordovician, Baltic Provinces.
- Distacodus sulcatus* SMITH, 1907. *Machairodus sulcata* SMITH, 1907 (p. 246, pl. 6, fig. 17). Ordovician, Arenig-Llandeilo, Ravengill, southern uplands of Scotland.
- Drepanodus* PANDER, 1856 (p. 20). Genotype (first species): *Drepanodus inflexus* PANDER, 1856.
- Drepanodus acutus* PANDER, 1856 (p. 21, pl. 2, fig. 9). Lower Ordovician, Baltic Provinces.
- Drepanodus arcuatus* PANDER, 1856 (p. 20, pl. 1, figs. 2, 4, 5, 17, 30, 31). Lower Ordovician, Baltic Provinces; HINDE, 1879 (p. 357, pl. 15, figs. 7, 8); GRABAU and SHIMER, 1910 (p. 245, figs. 1537 *d*, *e*); PARKS, 1922 (p. 36, pl. 6, figs. 21, 22). Ordovician, Lorraine-Dundas, Toronto, Canada.
- Drepanodus falcatus* HADDING, 1913 (p. 30, pl. 1, fig. 3). Ordovician, Dicellograptus zone, southern Norway.
- Drepanodus flexuosus* PANDER, 1856 (p. 20, pl. 1, figs. 6–8). Lower Ordovician, Baltic Provinces; SMITH, 1907 (p. 246, pl. 6, fig. 18). Ordovician, Arenig-Llandeilo, southern uplands of Scotland.

- Drepanodus inflexus* PANDER, 1856 (p. 20, pl. 1, fig. 3; pl. 2, fig. 16). Lower Ordovician, Baltic Provinces.
- Drepanodus obtusus* PANDER, 1856 (p. 21, pl. 2, fig. 11). Lower Ordovician, Baltic Provinces.
- Drepanodus robustus* HADDING, 1913 (p. 31, pl. 1, fig. 5). Ordovician, Dicellograptus zone, southern Norway.
- Drepanodus verutus* HADDING, 1913 (p. 31, pl. 1, fig. 4). Ordovician, Dicellograptus zone, southern Norway.
- Euprioniodina* ULRICH and BASSLER, 1926 (p. 29). Genotype: *Euprioniodina deflecta* ULRICH and BASSLER, 1926.
- Euprioniodina acicularis* HINDE, 1879, *Prioniodus acicularis* HINDE, 1879 (p. 360, pl. 15, figs. 18, 19). Devonian, Genesee, Kettle Point, Ontario; GRABAU, 1899 (p. 151, fig. 33E).
- Euprioniodina* ? *alata* HADDING, 1913, *Prioniodus alatus* HADDING, 1913 (p. 32, pl. 1, figs. 9, 10). Ordovician, Dicellograptus zone, southern Norway.
- Euprioniodina bryanti* ULRICH and BASSLER, 1926 (p. 29, pl. 3, figs. 13, 14; pl. 1, fig. 21). Upper Devonian, Rhinestreet shale of the Portage group, Shaleton, Erie County, N. Y.
- Euprioniodina conferta* ULRICH and BASSLER, 1926 (p. 29, pl. 3, fig. 13, 14; pl. 1, fig. 21). Upper Devonian, Rhinestreet shale of the Portage group, Shaleton, Erie County, N. Y.
- Euprioniodina conferta* ULRICH and BASSLER, 1926 (p. 29, pl. 3, fig. 17). Upper Devonian, Rhinestreet shale of the Portage group, Shaleton, Erie County, N. Y.
- Euprioniodina curvata* SMITH, 1907, *Prioniodus curvatus* SMITH, 1907 (p. 249, pl. 8, fig. 40). Ordovician, Arenig-Llandeilo, southern uplands of Scotland.
- Euprioniodina deflecta* ULRICH and BASSLER, 1926 (p. 29, pl. 3, figs. 11, 12). Upper Devonian, Rhinestreet shale of the Portage group, Shaleton, Erie County, N. Y.
- Euprioniodina* ? *discedens* HADDING, 1913, *Prioniodus discedens* HADDING, 1913 (p. 32, pl. 1, fig. 11). Ordovician, Dicellograptus zone, southern Norway.
- Euprioniodina* ? *furcata* HINDE, 1879, *Prioniodus furcatus* HINDE, 1879 (p. 358, pl. 15, fig. 13); PARKS, 1923 (p. 37, pl. 6, fig. 27). Upper Ordovician, Lorraine-Dundas, Garrison Common near Toronto, Ontario.
- Euprioniodina* ? *lanceolata* SMITH, 1907, *Polygnathus lanceolatus* SMITH, 1907 (p. 245, pl. 5, fig. 16). Ordovician, Arenig-Llandeilo, southern uplands of Scotland.
- Euprioniodina peculiaris* ULRICH and BASSLER, 1926 (p. 30, pl. 10, fig. 3). Mississippian, Hardin sandstone at base of Chattanooga shale, Mount Pleasant, Tenn.
- Euprioniodina perangulata* ULRICH and BASSLER, 1926 (p. 30, pl. 3, fig. 10). Upper Devonian, Rhinestreet shale of the Portage group, Shaleton, Erie County, N. Y.
- Euprioniodina* ? *radicans* HINDE, 1879, *Prioniodus radicans* HINDE, 1879 (p. 356, pl. 15, figs. 1-6; GRABAU and SHIMER, 1910 (p. 244, figs. 1538 a-c). Lower Ordovician (Chazy) Grenville, Quebec.
- Gnathodus* PANDER, 1856 (p. 33). Genotype (first species): *Gnathodus mosquensis* PANDER, 1856. See also HINDE, 1879 (p. 365); BRYANT, 1921 (p. 22); ULRICH and BASSLER, 1926 (p. 54), and ROUNDY, 1926 (p. 12).
- Gnathodus americanus* BRYANT, 1921 (p. 22, pl. 7, fig. 5). Upper Devonian, Genudewa limestone at base of Genesee, North Evans, Eighteen Mile Creek, N. Y.; ULRICH and BASSLER, 1926 (p. 54, pl. 1, fig. 5). Upper Devonian, Rhinestreet shale of the Portage group, Chaleton, Erie County, N. Y.

- Gnathodus ? crassus* HINDE, 1879, *Polygnathus crassus* HINDE, 1879 (p. 365, pl. 17, fig. 3); GRABAU, 1899 (p. 155, fig. 38); GRABAU and SHIMER, 1910 (p. 243, fig. 1535c). Genesee, Genundewa limestone, North Evans, Eighteen Mile Creek, N. Y. Possibly a side view of a *Polygnathus*.
- Gnathodus ? curvatus* HINDE, 1879, *Polygnathus ? curvatus* HINDE, 1879 (p. 366, pl. 17, fig. 7). "Genesee shale, Bear Creek, Ontario."
- Gnathodus ? eriensis* HINDE, 1879, *Polygnathus ? eriensis* HINDE, 1879 (p. 366, pl. 17, fig. 6). "Erratic boulder of black Genesee shale, north shore of Lake Erie, Ontario."
- Gnathodus mosquensis* PANDER, 1856 (p. 34, pl. 2A, fig. 10a, b, c). Carboniferous, Moscow, Russia, *Polygnathus (Gnathodus) mosquensis* HINDE, 1879 (p. 342, pl. 9, figs. 2-4). Carboniferous limestone, Dalry, etc., West Scotland.
- Gnathodus texanus* ROUNDY, 1926 (p. 12, pl. 2, figs. 7, 8). Barnett shale of Mississippian, San Saba County, Tex.
- Gnathodus texanus*, var. *bicuspidus* ROUNDY, 1926 (p. 12, pl. 12, fig. 9). Barnett shale of Mississippian, San Saba County, Tex.
- Hibbardella* ULRICH and BASSLER, 1926 (p. 37). Genotype: *Prioniodus angulatus* HINDE, 1879.
- Hibbardella angulata* HINDE, 1879, *Prioniodus angulatus* HINDE, 1879 (p. 360, pl. 15, fig. 17); GRABAU, 1899 (p. 151 fig. 33D); GRABAU and SHIMER, 1910 (p. 244, fig. 1537h); BRYANT, 1921 (p. 17). Upper Devonian, Rhinestreet shale of the Portage group, western New York. ? *Prioniodus angulatus* HINDE, 1900 (p. 343, pl. 10, figs. 18, 19). Carboniferous lower limestone. Dalry, etc., West Scotland; *Hibbardella angulata* (Hinde) ULRICH and BASSLER, 1926 (p. 37, pl. 3, figs. 1-4). Upper Devonian, Rhinestreet shale of the Portage group, Shaleton, Erie County, N. Y.
- Hibbardella ? confertissima* ULRICH and BASSLER, 1926 (p. 38, pl. 3, fig. 5). Upper Devonian, Rhinestreet shale of the Portage group, Shaleton, Erie County, N. Y.
- Hibbardella multidentis* ULRICH and BASSLER, 1926 (p. 38, pl. 3, figs. 8, 9). Upper Devonian, Rhinestreet shale of the Portage group, Shaleton, Erie County, N. Y.
- Hibbardella subaequalis* ULRICH and BASSLER, 1926 (p. 38, pl. 3, figs. 6, 7). Upper Devonian, Rhinestreet shale of the Portage group, Shaleton, Erie County, N. Y.
- Hindeodella* ULRICH and BASSLER, 1926 (p. 38). Genotype: *Hindeodella subtilis* ULRICH and BASSLER, 1926.
- Hindeodella alternata* ULRICH and BASSLER, 1926 (p. 40, pl. 1, figs. 14, 15). Upper Devonian, Rhinestreet shale of the Portage group, Shaleton, Erie County, N. Y.
- Hindeodella decurrens* ULRICH and BASSLER, 1926 (p. 40, pl. 8, fig. 13). Mississippian, Hardin sandstone at base of Chattanooga shale, Mount Pleasant, Tenn.
- Hindeodella dubia* SMITH, 1907. *Polygnathus dubius* SMITH, 1907, not Hinde, 1879 (p. 245, pl. 5, fig. 15). Ordovician, Arenig-Llandello, southern uplands of Scotland.
- Hindeodella duplicata* PANDER, 1856, *Lonchodus (Centroodus) duplicatus* PANDER, 1856 (p. 31, pl. 2A, figs. 7, 8). Carboniferous limestone, Tula, Russia. *Centroodus duplicatus* (Pander) HINDE, 1900 (p. 341, pl. 9, fig. 12). Carboniferous, upper limestone, Monkcastle, Kilwinning, west Scotland.
- Hindeodella lineata* PANDER, 1856, *Lonchodus (Centroodus) lineatus* PANDER, 1856 (p. 31, pl. 2A, fig. 9). Carboniferous limestone, Tula, Russia. *Centroodus lineatus* (Pander) HINDE, 1900 (p. 341, pl. 9, figs. 13, 14). Carboniferous, upper limestone, Monkcastle, Kilwinning, west Scotland. *Lonchodus ? lineatus* ROUNDY, 1926 (p. 15, pl. 3, figs. 6-8). Barnett shale of Mississippian, San Saba County, Tex.

- Hindcodella longidens* ULRICH and BASSLER, 1926 (p. 40, pl. 8, figs. 14, 15). Mississippian, Hardin sandstone at base of Chattanooga shale, Mount Pleasant, Tenn.
- Hindcodella obliqua* PANDER, 1856, *Centrodus obliquus* PANDER, 1856 (p. 33, pl. 2A, figs. 11, 12). Devonian, Gostinopolskoi, Pristan on the Wolchow River; HINDE, 1900 (p. 344, pl. 10, figs. 27-29). Carboniferous, lower limestone, Birkhead, Dalry, west Scotland.
- Hindcodella recta* ULRICH and BASSLER, 1926 (p. 40, pl. 8, fig. 16). Mississippian, Hardin sandstone at base of Chattanooga shale, Mount Pleasant, Tenn.
- Hindcodella similis* ULRICH and BASSLER, 1926 (p. 39, pl. 8, fig. 20). Mississippian, Hardin sandstone at base of Chattanooga shale, Mount Pleasant, Tenn.
- Hindcodella subequalis* ULRICH and BASSLER, 1926 (p. 41, pl. 4, fig. 21). Upper Devonian, Rhinestreet shale of Portage group, Shaleton, Erie County, N. Y.
- Hindcodella subtilis* ULRICH and BASSLER, 1926 (p. 39, pl. 8, figs. 17-19). Mississippian, Hardin sandstone at base of Chattanooga shale, Mount Pleasant, Tenn.
- Ligonodina* ULRICH and BASSLER, 1926 (p. 12), Genotype: *Ligonodina pectinata* ULRICH and BASSLER, 1926.
- Ligonodina deflecta* ULRICH and BASSLER, 1926 (13 pl. 2, figs. 3, 4). Upper Devonian, Rhinestreet shale of Portage group, Shaleton, Erie County, N. Y.
- Ligonodina falciformis* ULRICH and BASSLER, 1926 (p. 14, pl. 2, figs. 11-13). Upper Devonian, Rhinestreet shale of the Portage group, Shaleton, Erie County, N. Y.
- Ligonodina hibbaridi* ULRICH and BASSLER, 1926 (p. 14, pl. 2, figs. 7, 8). Upper Devonian, Rhinestreet shale of the Portage group, Shaleton, Erie County, N. Y.
- Ligonodina hindei* ULRICH and BASSLER, 1926 (p. 14, pl. 2, figs. 14-16). Upper Devonian, Rhinestreet shale of the Portage group, Shaleton, Erie County, N. Y.
- Ligonodina magnidens* ULRICH and BASSLER, 1926 (p. 14, pl. 2, figs. 5, 6). Upper Devonian, Rhinestreet shale of the Portage group, Shaleton, Erie County, N. Y.
- Ligonodina panderi* HINDE, 1879. *Prionodus panderi* HINDE, 1879 (p. 361, pl. 16, fig. 4); GRABAU, 1899 (p. 152, fig. 33H); GRABAU and SHILMER, 1910 (p. 244, fig. 1533a). Upper Devonian, Genesee or Portage, Eighteen Mile Creek, N. Y.
- Ligonodina panderi* (Hinde) ULRICH and BASSLER, 1926 (p. 13, pl. 2, figs. 1, 2). Upper Devonian, Rhinestreet shale of the Portage group, Shaleton, Erie County, N. Y.
- Ligonodina pectinata* ULRICH and BASSLER, 1926 (p. 13, pl. 2, figs. 9, 10). Upper Devonian, Rhinestreet shale of the Portage group, Shaleton, Erie County, N. Y.
- Ligonodina simplex* ULRICH and BASSLER, 1926 (p. 15, pl. 9, fig. 2S). Mississippian, Hardin sandstone at base of Chattanooga shale, Mount Pleasant, Tenn.
- Ligonodina tridentata* ULRICH and BASSLER, 1926 (p. 15, pl. 9, fig. 5). Mississippian, Hardin sandstone at base of Chattanooga shale, Mount Pleasant, Tenn.
- Lonchodina* ULRICH and BASSLER, 1926 (p. 30). Genotype: *Lonchodina typicalis* ULRICH and BASSLER, 1926.

- Lonchodina abnormis* ULRICH and BASSLER, 1926 (p. 34, pl. 6, figs. 8-10). Upper Devonian, Rhinestreet shale of the Portage group, Shaleton, Erie County, N. Y.
- Lonchodina alternata* ULRICH and BASSLER, 1926 (p. 35, pl. 6, fig. 4). Upper Devonian, Rhinestreet shale of the Portage group, Shaleton, Erie County, N. Y.
- Lonchodina arcuata* ULRICH and BASSLER, 1926 (p. 32, pl. 5, fig. 15). Upper Devonian, Rhinestreet shale of the Portage group, Shaleton, Erie County, N. Y.
- Lonchodina bilateralis* ULRICH and BASSLER, 1926 (p. 32, pl. 5, fig. 18.) Upper Devonian, Rhinestreet shale of the Portage group, Shaleton, Erie County, N. Y.
- Lonchodina clavata* HINDE, 1879, *Prioniodus clavatus* HINDE, 1879, (p. 360, pl. 15, fig. 16) ; GRABAU, 1899 (p. 151, fig. 33c) : GRABAU and SHIMER, 1910 (p. 244, fig. 1537b) ; BRYANT, 1921 (p. 16, pl. 6, figs. 3, 6). Upper Devonian, Genundewa limestone at base of Genesee, North Evans, Eighteen Mile Creek, N. Y.
- Lonchodina delicatula* ULRICH and BASSLER, 1926 (p. 33, pl. 5, fig. 11). Upper Devonian, Rhinestreet shale of the Portage group, Shaleton, Erie County, N. Y.
- Lonchodina discreta* ULRICH and BASSLER, 1926 (p. 36, pl. 10, figs. 1, 2). Mississippian, Hardin sandstone at base of Chattanooga shale, Mount Pleasant, Tenn.
- Lonchodina erratica* HINDE, 1879, *Prioniodus erraticus* HINDE, 1879 (p. 359, pl. 15, fig. 14) ; GRABAU, 1899 (p. 150, fig. 33A) ; GRABAU and SHIMER, 1910, p. 244, fig. 1537c) ; BRYANT, 1921 (p. 17, pl. 2, fig. 10 ; pl. 7, fig. 1). Upper Devonian, Genundewa limestone at base of Genesee, North Evans, Eighteen Mile Creek, N. Y.
- Lonchodina geniculata* ULRICH and BASSLER, 1926 (p. 36, pl. 4, fig. 15). Upper Devonian, Rhinestreet shale of the Portage group, Shaleton, Erie County, N. Y.
- Lonchodina ? increbescens* ULRICH and BASSLER, 1926 (p. 35, pl. 5, fig. 20 ; pl. 3, figs. 15, 16). Upper Devonian, Rhinestreet shale of the Portage group, Shaleton, Erie County, N. Y.
- Lonchodina paucidens* ULRICH and BASSLER, 1926 (p. 34, pl. 6, fig. 1). Upper Devonian, Rhinestreet shale of the Portage group, Shaleton, Erie County, N. Y.
- Lonchodina peracuta* ULRICH and BASSLER, 1926 (p. 33, pl. 5, fig. 19). Upper Devonian, Rhinestreet shale of the Portage group, Shaleton, Erie County, N. Y.
- Lonchodina perlonga* ULRICH and BASSLER, 1926 (p. 32, pl. 5, figs. 6, 7). Upper Devonian, Rhinestreet shade of the Portage group, Shaleton, Erie County, N. Y.
- Lonchodina ? projecta* ULRICH and BASSLER, 1926 (p. 35, pl. 5, figs. 9, 10). Upper Devonian, Rhinestreet shale of the Portage group, Shaleton, Erie County, N. Y.
- Lonchodina ? prona* ULRICH and BASSLER, 1926 (p. 36, pl. 5, figs. 16, 17). Upper Devonian, Rhinestreet shale of the Portage group, Shaleton, Erie County, N. Y.
- Lonchodina rectangulata* ULRICH and BASSLER, 1926 (p. 37, pl. 10, fig. 4). Mississippian, Hardin sandstone at base of Chattanooga shale, Mount Pleasant, Tenn.

- Lonchodina rectidens* ULRICH and BASSLER, 1926 (p. 31, pl. 5, figs. 13, 14). Upper Devonian, Rhinestreet shale of the Portage group, Shaleton, Erie County, N. Y.
- Lonchodina separata* ULRICH and BASSLER, 1926 (p. 31, pl. 5, fig. 12). Upper Devonian, Rhinestreet shale of the Portage group, Shaleton, Erie County, N. Y.
- Lonchodina ? spinata* HADDING, 1913, *Polygnathus spinatus* HADDING, 1913, (p. 32, pl. 1, fig. 8). Ordovician, Dicellograptus zone, Southern Norway.
- Lonchodina subangulata* ULRICH and BASSLER, 1926 (p. 32, pl. 5, fig. 3). Upper Devonian, Rhinestreet shale of the Portage group, Shaleton, Erie County, N. Y.
- Lonchodina subrecta* ULRICH and BASSLER, 1926 (p. 33, pl. 5, figs. 4, 5). Upper Devonian, Rhinestreet shale of the Portage group, Shaleton, Erie County, N. Y.
- Lonchodina subsymmetrica* ULRICH and BASSLER, 1926 (p. 34, pl. 6, figs. 5-7; pl. 5, fig. 8; pl. 1, fig. 24). Upper Devonian, Rhinestreet shale of the Portage group, Shaleton, Erie County, N. Y.
- Lonchodina transversa* ULRICH and BASSLER, 1926 (p. 34, pl. 6, figs. 2, 3). Upper Devonian, Rhinestreet shale of the Portage group, Shaleton, Erie County, N. Y.
- Lonchodina typicalis* ULRICH and BASSLER, 1926 (p. 31, pl. 5, figs. 1, 2). Upper Devonian, Rhinestreet shale of the Portage group, Shaleton, Erie County, N. Y.
- Lonchodus* PANDER, 1856 (p. 80) (*Centroodus* PANDER, 1856, p. 31, preoccupied); ULRICH and BASSLER, 1926 (p. 42); ROUNDY, 1926 (p. 15) Genotype (first species): *Lonchodus* (*Centroodus*) *simplex* PANDER, 1856.
- Lonchodus convexus* PANDER, 1856. *Centroodus convexus* PANDER, 1856 (p. 31, pl. 2A, fig. 4). Carboniferous limestone, Tula, Russia. *Polygnathus* (*Centroodus*) *convexus* (Pander) HINDE, 1900 (p. 342, pl. 9, figs. 6-8). Carboniferous, Upper limestone, Monkcastle, Dalry, etc., west Scotland.
- Lonchodus coronatus* HINDE, 1879, *Polygnathus coronatus* HINDE, 1879 (p. 365, pl. 17, fig. 1). Devonian, Genesee, Kettle Point, Ontario; GRABAU and SHIMER, 1910 (p. 243, fig. 1535a); BRYANT, 1921 (p. 21). Bryant records this species from Portage shale at Sturgeon Point, N. Y. Possibly a species of *Lonchodina* but Hinde's restoration does not match any of the species so far noted.
- Lonchodus curvatus* SMITH, 1907. *Polygnathus curvatus* SMITH, 1907 (p. 245, pl. 5, fig. 11). Ordovician, Arenig-Llandeilo, southern uplands of Scotland.
- Lonchodus distans* SMITH, 1907. *Centroodus distans* SMITH, 1907 (p. 244, pl. 5, fig. 7). Ordovician, Arenig-Llandeilo, southern uplands of Scotland.
- Lonchodus duplicatus* PANDER, 1856. See *Hindeodella duplicata*.
- Lonchodus erectus* SMITH, 1907. *Centroodus erectus* SMITH, 1907 (p. 244, pl. 5, figs. 1, 2, 4, 5). Ordovician, Arenig-Llandeilo, southern uplands of Scotland.
- Lonchodus lineatus* PANDER, 1856. See *Hindeodella lineata*.
- Lonchodus minus* SMITH, 1907. *Polygnathus minus* SMITH, 1907 (p. 245, pl. 5, fig. 8). Ordovician, Arenig-Llandeilo, southern uplands of Scotland.
- Lonchodus obliquus* SMITH, 1907. *Centroodus obliquus* SMITH, 1907 (p. 244, pl. 5, fig. 3). Ordovician, Arenig-Llandeilo, southern uplands of Scotland.
- Lonchodus parvus* SMITH, 1907. *Polygnathus parvus* SMITH, 1907 (p. 245, pl. 5, fig. 6). Ordovician, Arenig-Llandeilo, southern uplands of Scotland.

- Lonchodus princeps* HINDE, 1870. *Polygnathus princeps* HINDE, 1879 (p. 365, pl. 16, fig. 23); GRABAU, 1899 (p. 155, fig. 36); *Centrodus princeps* (Hinde) BRYANT, 1921 (p. 22, text fig. 6). Upper Devonian, Genundewa limestone at base of Genesee, North Evans, Eighteen Mile Creek, New York. *Polygnathus princeps* (Hinde) SMITH, 1907 (p. 245, pl. 5, figs. 9, 10, 12, 13). Ordovician, Arenig-Llandeilo, southern uplands of Scotland.
- Lonchodus simplex* PANDER, 1856. *Centrodus simplex* PANDER, 1856 (p. 31, pl. 2A, figs. 2, 3, 5, 6). Carboniferous limestone, Tula, Russia; ROUNDY, 1926 (p. 15, pl. 3, figs. 1-5). Barnett shale of Mississippian, San Saba County, Texas.
- Machairodia* SMITH, 1907. See *Distacodus* HINDE, 1879.
- Machairodus* PANDER, 1856. See *Distacodus* HINDE, 1879.
- Oistodus* PANDER, 1856 (p. 27). Genotype (first species): *Oistodus lanceolatus* PANDER, 1856.
- Oistodus acuminatus* PANDER, 1856 (p. 27, pl. 2, fig. 20). Lower Ordovician, Baltic Provinces.
- Oistodus inaequalis* PANDER, 1856 (p. 27, pl. 2, fig. 37). Lower Ordovician, Baltic Provinces.
- Oistodus lanceolatus* PANDER, 1856 (p. 27, pl. 2, figs. 17-19). Lower Ordovician, Baltic Provinces.
- Oistodus parallelus* PANDER, 1856 (p. 27, pl. 2, fig. 40). Lower Ordovician, Baltic Provinces.
- Pachysomia* SMITH, 1907 (p. 246); ULRICH and BASSLER, 1926 (p. 43). Genotype: *Pachysomia wanlockensis* Smith, 1907.
- Pachysomia wanlockensis* SMITH, 1907 (p. 246, pl. 6, fig. 23). Ordovician, Arenig-Llandeilo, southern uplands of Scotland.
- Palmatodella* ULRICH and BASSLER, 1926 (p. 41). Genotype: *Palmatodella delicatula* ULRICH and BASSLER, 1926.
- Palmatodella delicatula* ULRICH and BASSLER, 1926 (p. 41, pl. 10, fig. 5; text fig. 20). Mississippian, Chattanooga shale, north of Huntsville, Alabama and Hardin sandstone at base of Chattanooga shale, Mount Pleasant, Tenn.
- Palmatolepis* ULRICH and BASSLER, 1926 (p. 49). Genotype: *Palmatolepis perlobata* ULRICH and BASSLER, 1926.
- Palmatolepis asymmetrica* ULRICH and BASSLER, 1926 (p. 50, pl. 7, fig. 18). Mississippian, Hardin sandstone at base of Chattanooga shale, Mount Pleasant, Tenn.
- Palmatolepis bifurcata* ULRICH and BASSLER, 1926 (p. 50, pl. 7, figs. 16, 17). Mississippian, Hardin sandstone at base of Chattanooga shale, Mount Pleasant, Tenn.
- Palmatolepis extralobata* ULRICH and BASSLER, 1926 (p. 50, pl. 8, fig. 3). Mississippian, Hardin sandstone at base of Chattanooga shale, Mount Pleasant, Tenn.
- Palmatolepis glaber* ULRICH and BASSLER, 1926 (p. 51, pl. 9, figs. 18-20). Mississippian, Hardin sandstone at base of Chattanooga shale, Mount Pleasant, Tenn.
- Palmatolepis lobatula* ULRICH and BASSLER, 1926 (p. 50, pl. 7, figs. 3, 4). Mississippian, Hardin sandstone at base of Chattanooga shale, Mount Pleasant, Tenn.
- Palmatolepis peculiaris* ULRICH and BASSLER, 1926 (p. 51, pl. 8, figs. 11, 12). Mississippian, Hardin sandstone at base of Chattanooga shale, Mount Pleasant, Tenn.

- Palmatolepis perlobata* ULRICH and BASSLER, 1926 (p. 49, pl. 7, figs. 19-23). Mississippian, Hardin sandstone at base of Chattanooga shale, Mount Pleasant, Tenn.
- Palmatolepis punctata* HINDE, 1879. *Polygnathus punctatus* HINDE, 1879 (p. 367, pl. 17, fig. 14); GRABAU, 1899 (p. 157, fig. 43); GRABAU and SHIMER, 1910 (p. 244, fig. 1536d); BRYANT, 1921 (p. 25). Devonian, Genundewa limestone, at base of Genesee, North Evans, Eighteen Mile Creek, New York; ULRICH and BASSLER, 1926 (p. 51, pl. 1, figs. 6, 7). Rhinestreet shale of Portage group, Shaleton, Erie County, New York.
- Paltodus* PANDER, 1856 (p. 24). Genotype (first species): *Paltodus subaequalis* PANDER, 1856.
- Paltodus bicostatus* PANDER, 1856 (p. 25, pl. 1, fig. 21). Lower Ordovician, Baltic Provinces.
- Paltodus canaliculatus* PANDER (p. 25, pl. 1, fig. 36). Lower Ordovician, Baltic Provinces.
- Paltodus obtusus* PANDER, 1856 (p. 24, pl. 1, figs. 13, 16, 29, 32). Lower Ordovician, Baltic Provinces.
- Paltodus rotundatus* PANDER, 1856 (p. 25, pl. 1, figs. 33, 34). Lower Ordovician, Baltic Provinces.
- Paltodus subaequalis* PANDER, 1856 (p. 24, pl. 1, fig. 24). Lower Ordovician, Baltic Provinces.
- Paltodus truncatus* PANDER, 1856 (p. 25, pl. 1, figs. 18-20). Lower Ordovician, Baltic Provinces.
- Panderodella* ULRICH and BASSLER, 1926 (p. 52). Genotype: *Panderodella truncata* ULRICH and BASSLER, 1926.
- Panderodella maxillaris* ULRICH and BASSLER, 1926 (p. 53, pl. 9, fig. 21). Mississippian, Hardin sandstone at base of Chattanooga shale, Mount Pleasant, Tenn.
- Panderodella scitula* HINDE, 1900, *Polygnathus scitulus* HINDE, 1900 (p. 343, pl. 9, figs. 9-11). Carboniferous, upper limestone, Dalry, etc., west Scotland.
- Panderodella serrata* HINDE, 1879, *Polygnathus serratus* HINDE, 1879 (p. 365, pl. 17, figs. 4, 5). Devonian, Genesee, Kettle Point, Ontario.
- Panderodella solida* HINDE, 1879, *Polygnathus solidus* HINDE, 1879 (p. 365, pl. 17, fig. 2); GRABAU, 1899 (p. 155, fig. 37); GRABAU and SHIMER, 1910 (p. 243, fig. 1535b); BRYANT, 1921 (p. 27, pl. 7, figs. 7-10, 12). Upper Devonian, Genundewa limestone at base of Genesee, North Evans, Eighteen Mile Creek, N. Y.
- Panderodella subcrassa* ULRICH and BASSLER, 1926 (p. 53, pl. 9, fig. 14). Mississippian, Hardin sandstone at base of Chattanooga shale, Mount Pleasant, Tenn.
- Panderodella truncata* ULRICH and BASSLER, 1926 (p. 52, pl. 9, figs. 15-17). Mississippian, Hardin sandstone at base of Chattanooga shale, Mount Pleasant, Tenn.
- Polygnathellus* ULRICH and BASSLER, 1926 (p. 53). Genotype: *Polygnathellus typicalis* Ulrich and Bassler, 1926.
- Polygnathellus colligatus* BRYANT, 1921, *Prioniodus colligatus* BRYANT, 1921, (p. 17, pl. 3, figs. 1, 2, 4; pl. 5, figs. 6, 10; pl. 6, fig. 8; pl. 7, figs. 2, 6). Upper Devonian, Genundewa limestone at base of Genesee, North Evans, Eighteen Mile Creek, N. Y.
- Polygnathellus curvatus* ULRICH and BASSLER, 1926 (p. 54, pl. 1, fig. 4). Upper Devonian, Rhinestreet shale of Portage group, Shaleton, Erie County, N. Y.
- Polygnathellus typicalis* ULRICH and BASSLER, 1926 (p. 53, pl. 1, figs. 1-3). Upper Devonian, Rhinestreet shale of Portage group, Shaleton, Erie County, N. Y.

- Polygnathidae* ULRICH and BASSLER, 1926 (p. 43).
- Polygnathus* HINDE, 1879 (p. 361); BRYANT, 1921 (p. 23); ULRICH and BASSLER, 1926 (p. 43); ROUNDY, 1926 (p. 13). Genotype: *Polygnathus pennatus* HINDE, 1879 (*Polygnathus dubius* HINDE, 1879, part).
- Polygnathus ? acaulis* ULRICH and BASSLER, 1926 (p. 47, pl. 8, figs. 4, 5). Mississippian, Hardin sandstone at base of Chattanooga shale, Mount Pleasant, Tenn.
- Polygnathus alternans* HADDING, 1913. See *Prioniodus ? alternans*.
- Polygnathus argos* T. H. CLARK, 1924 (p. 70, pl. 6, fig. 7). Not a conodont. probably fringe of appendage of merostome or trilobite. Canadian, Point Levis, Canada.
- Polygnathus bilineatus* ROUNDY, 1926 (p. 13, pl. 3, fig. 10). Barnett shale of Mississippian, San Saba County, Tex.
- Polygnathus caelatus* BRYANT, 1921 (p. 27, pl. 13, figs. 1-13). Upper Devonian, Genundewa limestone at base of Genesee, North Evans, Eighteen Mile Creek, N. Y.
- Polygnathus ? claviger* ROUNDY, 1926 (p. 14, pl. 4, figs. 1, 2). Barnett shale of Mississippian, San Saba County, Tex.
- Polygnathus concentricus* ULRICH and BASSLER, 1926 (p. 47, pl. 8, figs. 6, 7). Mississippian, Hardin sandstone at base of Chattanooga shale, Mount Pleasant, Tenn.
- Polygnathus confluens* ULRICH and BASSLER, 1926 (p. 46, pl. 7, figs. 14, 15). Mississippian, Hardin sandstone at base of Chattanooga shale, Mount Pleasant, Tenn.
- Polygnathus convexus* HINDE, 1900. See *Lonchodus convexus*.
- Polygnathus crassulus* ULRICH and BASSLER, 1926 (p. 48, pl. 8, figs. 8-10). Mississippian, Hardin sandstone at base of Chattanooga shale, Mount Pleasant, Tenn.
- Polygnathus crassus* HINDE, 1879. See *Gnathodus ? crassus*.
- Polygnathus cristatus* HINDE, 1879 (p. 366, pl. 17, fig. 11); J. M. CLARKE, 1886 (pl. A-1, fig. 20); BRYANT, 1921 (p. 24); *Polygnathus dubius* HINDE, 1879 (p. 363, pl. 16, figs. 16, 18); J. W. CLARKE, 1886 (pl. A-1, fig. 20). Described from Genundewa limestone at North Evans, but probably from Portage beds of same locality, according to Bryant.
- Polygnathus ? curvatus* HINDE, 1879. See *Gnathodus curvatus*.
- Polygnathus curvatus* SMITH, 1907. See *Lonchodus curvatus*.
- Polygnathus delicatulus* ULRICH and BASSLER, 1926 (p. 45, pl. 7, figs. 9, 10). Mississippian, Hardin sandstone at base of Chattanooga shale, Mount Pleasant, Tenn.
- Polygnathus dubius* HINDE, 1879 (p. 362, pl. 16, figs. 6-18); GRABAU, 1899 (p. 153, fig. 34); GRABAU and SHIMER, 1910 (p. 243, figs. 1533c-i; 1534a-c). Described from an assemblage of species of different genera on a slab probably of Portage age, western New York; J. M. CLARKE, 1886, pl. A-1. Naples shale, Naples, N. Y. See *Polygnathus pennatus*.
- Polygnathus dubius* SMITH, 1900. See *Bryantodus dubius*.
- Polygnathus dubius* SMITH, 1907. See *Hæncodeila dubia*.
- Polygnathus duplicatus* HINDE, 1879. See *Bryantodus duplicatus*.
- Polygnathus ? eriensis* HINDE, 1879. See *Gnathodus eriensis*.
- Polygnathus foliatus* BRYANT, 1921 (p. 24, pl. 10, figs. 13-16). Upper Devonian, Genundewa limestone at base of Genesee, North Evans, Eighteen Mile Creek, N. Y.
- Polygnathus folium* ULRICH and BASSLER, 1926 (p. 46, pl. 7, fig. 5). Mississippian, Hardin sandstone at base of Chattanooga shale, Mount Pleasant, Tenn.

- Polygnathus germanus* ULRICH and BASSLER, 1926 (p. 46, pl. 7, figs. 11, 12). Mississippian, Hardin sandstone at base of Chattanooga shale, Mount Pleasant, Tenn.
- Polygnathus glaber* ULRICH and BASSLER, 1926 (p. 46, pl. 7, fig. 13). Mississippian, Hardin sandstone at base of Chattanooga shale, Mount Pleasant, Tenn.
- Polygnathus immersus* HINDE, 1879. See *Bryantodus immersus*.
- Polygnathus lanceolatus* SMITH, 1907. See *Euprioniodina* ? *lanceolata*.
- Polygnathus linguiformis* HINDE, 1879 (p. 367, pl. 17, fig. 15); GRABAU, 1899 (p. 157, pl. 44); BRYANT, 1921 (p. 25, pl. 11, figs. 1-9; pl. 14, fig. 2). *Polygnathus simplex* HINDE, 1879 (p. 367, pl. 17, fig. 18); GRABAU, 1899 (p. 157, fig. 46). Upper Devonian, Genundewa limestone at base of Genesee, North Evans, Eighteen Mile Creek, N. Y. North Shore of Lake Erie, Ontario.
- Polygnathus minus* SMITH, 1907. See *Lonchodus minus*.
- Polygnathus mosquensis* HINDE, 1879. See *Gnathodus mosquensis*.
- Polygnathus nasutus* HINDE, 1879. See *Synprioniodina nasuta*.
- Polygnathus navicula* HINDE, 1900 (p. 342, pl. 9, fig. 5). Carboniferous. Upper limestone near Douglass, West Scotland.
- Polygnathus ordinatus* BRYANT, 1921 (p. 24, pl. 10, figs. 10, 11). Upper Devonian, Genundewa limestone at base of Genesee, North Evans, Eighteen Mile Creek, N. Y.
- Polygnathus palmatus* HINDE, 1879 (p. 367, pl. 17, figs. 16, 17); GRABAU, 1899 (p. 157); GRABAU and SHIMER, 1910 (p. 244, fig. 1536h). Genesee (?Portage) Kettle Paint, Ontario.
- Polygnathus parvus* SMITH, 1907. See *Lonchodus parvus*.
- Polygnathus pauperatus* SMITH, 1907. See *Prioniodus pauperatus*.
- Polygnathus pennatus* HINDE, 1879 (p. 366, pl. 17, fig. 8); J. M. CLARKE, 1866 (pl. A-1, fig. 9); GRABAU, 1899 (p. 156, fig. 39); GRABAU and SHIMER, 1910 (p. 243, fig. 1536a); BRYANT, 1921 (p. 23, pl. 10, figs. 1-9). *Polygnathus dubius* HINDE, 1879 (part), (p. 363, pl. 16, fig. 17); J. M. CLARKE, 1866 (pl. A-1, figs. 2, 3, 13). Upper Devonian, Genundewa limestone at base of Genesee, North Evans, Eighteen Mile Creek, N. Y.
- Polygnathus pennatulus* ULRICH and BASSLER, 1926 (p. 45, pl. 7, fig. 8, pl. 9, figs. 24, 25). Mississippian, Hardin sandstone at base of Chattanooga shale, Mount Pleasant, Tenn.
- Polygnathus peracutus* BRYANT, 1921 (p. 25, pl. 10, fig. 12). Upper Devonian. Genundewa limestone at base of Genesee, North Evans, Eighteen Mile Creek, N. Y.
- Polygnathus princeps* HINDE, 1879. See *Lonchodus princeps*.
- Polygnathus punctatus* HINDE, 1879. See *Palmatolepis punctata*.
- Polygnathus radiatus* HINDE, 1879. See *Bryantodus radiatus*.
- Polygnathus rhomboideus* ULRICH and BASSLER, 1926 (p. 46, pl. 7, fig. 6). Mississippian, Hardin sandstone at base of Chattanooga shale, Mount Pleasant, Tenn.
- Polygnathus rimulatus* ULRICH and BASSLER, 1926 (p. 45, pl. 1, figs. 8, 9). Devonian, Rhinestreet shale, Shaletton, N. Y.
- Polygnathus rotundilobus* BRYANT, 1921 (p. 26, pl. 12, figs. 1-6; text fig. 7). *Polygnathus tuberculatus* HINDE, 1879 (part) (p. 366, pl. 17, fig. 10). Upper Devonian, Genundewa limestone at base of Genesee, North Evans, Eighteen Mile Creek, N. Y.
- Polygnathus scitulus* HINDE, 1900. See *Panderodella scitula*.
- Polygnathus serratus* HINDE, 1879. See *Panderodella serrata*.

- Polygnathus simplex* HINDE, 1879. Synonym for *Polygnathus linguiformis* HINDE, 1879.
- Polygnathus solidus* HINDE, 1879. See *Panderodella solida*.
- Polygnathus spinatus* HADDING, 1913. See *Lonchodina* ? *spinata*.
- Polygnathus sublatus* ULRICH and BASSLER, 1926 (p. 47, pl. 8, fig. 2). Mississippian, Hardin sandstone at base of Chattanooga shale, Mount Pleasant, Tenn.
- Polygnathus taffi* ROUNDY, 1926 (p. 13, pl. 3, fig. 11). Barnett shale of Mississippian, San Saba County, Tex.
- Polygnathus texanus* ROUNDY, 1926 (p. 14, pl. 3, fig. 13). Barnett shale of Mississippian, San Saba County, Tex.
- Polygnathus truncatus* HINDE, 1879 (p. 366, pl. 17, figs. 12, 13); GRABAU, 1899 (p. 156, fig. 42); GRABAU and SHIMER, 1910 (p. 243, figs. 1536*b*, *c*). "Genesee, Bear Creek, Ontario."
- Polygnathus tuberculatus* HINDE, 1879 (p. 366, pl. 17, figs. 9, 10); GRABAU, 1899 (p. 156, fig. 40); GRABAU and SHIMER, 1910 (p. 244, figs. 1536*e*, *f*); BRYANT, 1921 (p. 25, pl. 12, figs. 7-9). Upper Devonian, Genundewa limestone at base of Genesee, North Evans, Eighteen Mile Creek, N. Y.
- Polygnathus wilsoni* U. P. JAMES, 1884 (p. 148, pl. 7, fig. C). Ordovician (Maysville) Warren County, Ohio. Fossil of uncertain affinities.
- Prioniodella* ULRICH and BASSLER, 1926 (p. 18). Genotype: *Prioniodella normalis* Ulrich and Bassler, 1926.
- Prioniodella aequidens* ULRICH and BASSLER, 1926 (p. 19, pl. 4, figs. 6, 7). Upper Devonian, Rhinestreet shale of Portage group, Shaleton, Erie County, N. Y.
- Prioniodella brevispina* ULRICH and BASSLER, 1926 (p. 20, pl. 10, fig. 21). Mississippian, Hardin sandstone at base of Chattanooga shale, Mount Pleasant, Tenn.
- Prioniodella conferta* ULRICH and BASSLER, 1926 (p. 21, pl. 10, fig. 25.) Mississippian, Hardin sandstone at base of Chattanooga shale, Mount Pleasant, Tenn.
- Prioniodella gracilis* ULRICH and BASSLER, 1926 (p. 20, pl. 10, figs. 22, 23). Mississippian, Hardin sandstone at base of Chattanooga shale, Mount Pleasant, Tenn.
- Prioniodella inaequalis* ULRICH and BASSLER, 1926 (p. 19, pl. 4, figs. 2, 3). Upper Devonian, Rhinestreet shale of Portage group, Shaleton, Erie County, N. Y.
- Prioniodella informata* ULRICH and BASSLER, 1926 (p. 20, pl. 10, figs. 19, 20). Mississippian, Hardin sandstone at base of Chattanooga shale, Mount Pleasant, Tenn.
- Prioniodella invalida* BRYANT, 1921. *Centroodus invalidus* BRYANT, 1921 (p. 21, pl. 3, figs. 3, 5). Upper Devonian, Genundewa limestone at base of Genesee, North Evans, Eighteen Mile Creek, N. Y.
- Prioniodella multidentis* ULRICH and BASSLER, 1926 (p. 19, pl. 4, figs. 4, 5). Upper Devonian, Rhinestreet shale of Portage group, Shaleton, Erie County, N. Y.
- Prioniodella normalis* ULRICH and BASSLER, 1926 (p. 19, pl. 4, figs. 1, 1'). Upper Devonian, Rhinestreet shale of Portage group, Shaleton, Erie County, N. Y.
- Prioniodella robusta* ULRICH and BASSLER, 1926 (p. 20, pl. 10, fig. 24). Mississippian, Hardin sandstone at base of Chattanooga shale, Mount Pleasant, Tenn.
- Prioniodidae* ULRICH and BASSLER, 1926 (p. 7).
- Prioniodina* ULRICH and BASSLER, 1926 (p. 18). Genotype: *Prioniodina subcurvata* Ulrich and Bassler, 1926.
- Prioniodina?* *gemina* HINDE, 1900. *Prioniodus geminus* HINDE, 1900 (p. 344, pl. 10, fig. 25). Carboniferous, Upper limestone, Glencart, etc., west Scotland.

- Prioniodina recedens* BRYANT, 1921, *Prioniodus recedens* Bryant, 1921 (p. 13, text fig. 3; pl. 1, figs. 1, 2, 6-14; pl. 2, figs. 1-4, 7, 9). Upper Devonian, Genundewa limestone at base of Genesee, North Evans, Eighteen Mile Creek, N. Y.
- Prioniodina separata* ULRICH and BASSLER, 1926 (p. 18, pl. 4, figs. 17, 18). Upper Devonian, Rhinestreet shale of Portage group, Shaletton, Erie County, N. Y.
- Prioniodina subcurvata* ULRICH and BASSLER, 1926 (p. 18, pl. 4, figs. 22-24). Upper Devonian, Rhinestreet shale of Portage group, Shaletton, Erie County, N. Y.
- Prioniodina? volborthii* PANDER, 1856. *Prioniodus volborthii* PANDER, 1856 (p. 30, fig. A on p. 20). Carboniferous? of Russia.
- Prioniodinidae* ULRICH and BASSLER, 1926 (p. 15).
- Prioniodus* PANDER, 1856 (p. 29); ROUNDY, 1926 (p. 10); ULRICH and BASSLER, 1926 (p. 8). Genotype (first species); *Prioniodus elegans* PANDER, 1856.
- Prioniodus abbreviatus* HINDE, 1879 (p. 359, pl. 15, fig. 15); GRABAU, 1899 (p. 150, fig. 33B); GRABAU and SHIMER, 1910 (p. 244, fig. 1537a); BRYANT, 1921 (p. 14, pl. 1, figs. 3-5; pl. 3, fig. 7). Upper Devonian, Genundewa limestone at base of Genesee, North Evans, Eighteen Mile Creek, N. Y.
- Prioniodus acicularis* HINDE, 1879. See *Euprioniodina acicularis*.
- Prioniodus alatus* HINDE, 1879 (p. 361, pl. 16, fig. 5); GRABAU, 1899 (p. 153, fig. 331); GRABAU and SHIMER, 1910 (p. 244, fig. 1533b); BRYANT, 1921 (p. 15, pl. 3, fig. 10; pl. 4, figs. 1-7). Upper Devonian, Genundewa limestone at base of Genesee, North Evans, Eighteen Mile Creek, N. Y.; ULRICH and BASSLER, 1926 (p. 11, pl. 1, figs. 25, 26). Upper Devonian, Rhinestreet shale of Portage group, Shaletton, Erie County, N. Y.
- Prioniodus alatus* HADDING, 1913. See *Euprioniodina ? alata*.
- Prioniodus ? alternans* HADDING, 1913. *Polygnathus alternans* HADDING, 1913 (p. 32, pl. 1, fig. 7). Ordovician, Dicollograptus zone), southern Norway.
- Prioniodus angulatus* HINDE, 1879, 1900. See *Hibbardella angulata*.
- Prioniodus armatus* HINDE, 1879 (p. 360, pl. 15, figs. 20, 21); GRABAU, 1899 (p. 152, fig. 33F); GRABAU and SHIMER, 1910 (p. 244, figs. 1537 f, g); BRYANT, 1921 (p. 18); ULRICH and BASSLER, 1926 (p. 12). "Genesee, North Evans, N. Y." Apparently from Rhinestreet shale of Portage, western New York.
- Prioniodus ? carinatus* PANDER, 1856 (p. 30, pl. 2, fig. 25). Lower Ordovician, Baltic Provinces.
- Prioniodus clavatus* HINDE, 1879. See *Lonchodina clavata*.
- Prioniodus colligatus* BRYANT, 1921. See *Polygnathellus colligatus*.
- Prioniodus complex* HINDE, 1900 (p. 344, pl. 10, fig. 24). Carboniferous, Upper limestone, Glencart, etc., west Scotland.
- Prioniodus concavus* ULRICH and BASSLER, 1926 (p. 10, pl. 9, fig. 11). Mississippian, Hardin sandstone at base of Chattanooga shale, Mount Pleasant, Tenn.
- Prioniodus cristatus* BRYANT, 1921. See *Bryantodus cristatus*.
- Prioniodus cultratus* ULRICH and BASSLER, 1926 (p. 9, pl. 9, fig. 7). Mississippian Hardin sandstone at base of Chattanooga shale, Mount Pleasant, Tenn.
- Prioniodus curvatus* SMITH, 1907. See *Euprioniodina curvata*.
- Prioniodus curvidens* ULRICH and BASSLER, 1926 (p. 11, pl. 1, figs. 16, 17). Upper Devonian, Rhinestreet shale of Portage group, Shaletton, Erie County, N. Y.
- Prioniodus dilata* BRYANT, 1921, *Prioniodus dilatus* BRYANT, 1921 (p. 20, pl. 7, figs. 3, 4, 11). Upper Devonian, Genundewa limestone at base of Genesee, North Evans, Eighteen Mile Creek, N. Y.
- Prioniodus discedens* HADDING, 1913. See *Euprioniodina ? discedens*.

- Prioniodus disparilis* ULRICH and BASSLER, 1926 (p. 10, pl. 9, fig. 12). Mississippian, Hardin sandstone at base of Chattanooga shale, Mount Pleasant, Tenn.
- Prioniodus dorcens* T. H. CLARK, 1924 (p. 68, pl. 6, fig. 3). Not a conodont, but a spiny terminal fragment of trilobite. Canadian, Point Levis, Canada.
- Prioniodus dychei* U. P. JAMES, 1884 (p. 148, pl. 7, figs. A, C.). Ordovician (Maysville), Warren County, Ohio. Probably an annelid jaw.
- Prioniodus elegans* PANDER, 1856 (p. 29, pl. 2, figs. 22, 23). Lower Ordovician, Baltic Provinces. HINDE, 1879 (p. 358, pl. 15, fig. 10); GRABAU and SHIMER, 1910 (p. 244, fig. 1538d); PARKS, 1922 (p. 36, pl. 6, fig. 24). Upper Ordovician, Lorraine-Dundas, Toronto, Ontario.
- Prioniodus equalis* SMITH, 1907 (p. 249, pl. 8, figs. 38, 39). Ordovician, Arenig-Llandeilo, southern uplands of Scotland.
- Prioniodus erraticus* HINDE, 1879. See *Lonchodina erratica*.
- Prioniodus furcatus* HINDE, 1879. See *Euprioniodina? furcata*.
- Prioniodus geminus* HINDE. See *Prioniodina? gemina*.
- Prioniodus hamatus* BRYANT, 1921 (p. 15, text fig. 5; pl. 2, figs. 5, 6, 8, 11). Upper Devonian, Genudewa limestone at base of Genesee, North Evans, Eighteen Mile Creek, N. Y.
- Prioniodus healdi* ROUNDY, 1926 (p. 10, pl. 4, fig. 5). Barnett shale of Mississippian, San Saba County, Tex.
- Prioniodus immersus* BRYANT, 1921. See *Bryantodus immersus*.
- Prioniodus inequalis* ULRICH and BASSLER, 1926 (p. 10, pl. 9, fig. 6). Mississippian, Hardin sandstone at base of Chattanooga shale, Mount Pleasant, Tenn.
- Prioniodus inflatus* SMITH, 1907 (p. 249, pl. 8, fig. 36). Ordovician, Arenig-Llandeilo, southern uplands of Scotland.
- Prioniodus inutilis* ULRICH and BASSLER, 1926 (p. 11, pl. 1, fig. 23). Upper Devonian, Rhinestreet shale of Portage group, Shaletton, Erie County, N. Y.
- Prioniodus lelaps* T. H. CLARK, 1924 (p. 69, pl. 6, fig. 4). Not a conodont, but an annelid jaw, Canadian, Point Levis, Canada.
- Prioniodus macconochii* SMITH, 1907 (p. 249, pl. 8, figs. 41, 42). Ordovician, Arenig-Llandeilo, southern uplands of Scotland.
- Prioniodus macrodentatus* BRYANT, 1921. See *Bryantodus macrodentatus*.
- Prioniodus melampus* T. H. CLARKE, 1924 (p. 68, pl. 6, fig. 2). Not a conodont, but the spiny terminal fragment of a trilobite, Canadian, Point Levis, Canada.
- Prioniodus muricatus* BRYANT, 1921. See *Bryantodus muricatus*.
- Prioniodus nasutus* BRYANT, 1921. See *Synprioniodina nasuta*.
- Prioniodus obtusus* BRYANT, 1921. See *Bryantodus obtusus*.
- Prioniodus pamphagus* T. H. CLARK, 1924 (p. 70, pl. 6, fig. 6). Not a conodont, but an annelid jaw and the same as *Prioniodus lelaps* T. H. Clark, 1924 Canadian, Point Levis, Canada.
- Prioniodus panderi* HINDE, 1879. See *Ligonodina panderi*.
- Prioniodus parvidentatus* ULRICH and BASSLER, 1926 (p. 9, pl. 9, fig. 1). Mississippian, Hardin sandstone at base of Chattanooga shale, Mount Pleasant Tenn.
- Prioniodus parvulus* BRYANT, 1921. See *Bryantodus parvulus*.
- Prioniodus pauperatus* SMITH, 1907. *Polygnathus pauperatus* SMITH, 1907, (p. 245, pl. 5, fig. 14). Ordovician, Arenig-Llandeilo, southern uplands of Scotland.
- Prioniodus peracutus* HINDE, 1900 (p. 343, pl. 10, figs. 21-23). Carboniferous, lower and upper limestone, Monkcastle, Dalry, etc., west Scotland; ROUNDY, 1926 (p. 10, pl. 4, figs. 6-8) Barnett shale of Mississippian, San Saba County, Tex.

- Prioniodus politus* HINDE, 1879. See *Bryantodus politus*.
- Prioniodus porcatus* HINDE, 1900 (p. 344, pl. 10, fig. 26). Carboniferous, upper limestone, Monkcastle, etc., west Scotland.
- Prioniodus pravus* BRYANT, 1921. See *Bryantodus pravus*.
- Prioniodus proclinatus* ULRICH and BASSLER, 1926 (p. 10, pl. 1, fig. 22). Upper Devonian, Rhinestreet shale of Portage group, Shaletton, Erie County, N. Y.
- Prioniodus proclinis* ULRICH and BASSLER, 1926 (p. 9, pl. 9, figs. 8-10). Mississippian, Hardin sandstone at base of Chattanooga shale, Mount Pleasant, Tenn.
- Prioniodus radiatus* BRYANT, 1921. See *Bryantodus radiatus*.
- Prioniodus radicans* HINDE, 1879. See *Euprioniodina radicans*.
- Prioniodus recedens* BRYANT, 1921. See *Prioniodina recedens*.
- Prioniodus retusus* BRYANT, 1921. See *Bryantodus retusus*.
- Prioniodus reversus* ULRICH and BASSLER, 1926 (p. 10, pl. 9, fig. 4). Mississippian, Hardin sandstone at base of Chattanooga shale, Mount Pleasant, Tenn.
- Prioniodus spatulatus* BRYANT, 1921. See *Bryantodus spatulatus*.
- Prioniodus spicatus* ULRICH and BASSLER, 1926 (p. 9, pl. 9, figs. 2, 3). Mississippian, Hardin sandstone at base of Chattanooga shale, Mount Pleasant, Tenn.
- Prioniodus spicatus* HINDE, 1879 (p. 361, pl. 16, figs. 1-3); CLARKE, 1886, (pl. A-1, fig. 22); GRABAU, 1899 (p. 152, fig. 33G); BRYANT, 1921 (p. 19). Upper Devonian, Portage-Naples and Rhinestreet shales, western New York; HINDE, 1900 (p. 343, pl. 10, fig. 20). Carboniferous, lower limestone, Birkhead, Dalry, etc., west Scotland.
- Prioniodus subcompactus* SMITH, 1907 (p. 249, pl. 8, fig. 37). Ordovician, Arenig-Llandeilo, southern uplands of Scotland.
- Prioniodus sulcatus* PANDER, 1856 (p. 29, pl. 2, fig. 24). Lower Ordovician, Baltic Provinces.
- Prioniodus tigris* T. H. CLARK, 1924 (p. 69, pl. 6, fig. 5). Not a conodont, but probably fringe appendage of merostome or trilobite. Canadian, Point Levis, Canada.
- Prioniodus theron* T. H. CLARK, 1924 (p. 67, pl. 6, fig. 1). Not a conodont; probably fringe appendage of merostome or trilobite. Canadian, Point Levis, Canada.
- Prioniodus tulensis* PANDER, 1856 (p. 30, pl. 2A, figs. 1, 18-20). Carboniferous limestone, Tula, Russia; HINDE, 1900 (p. 343, pl. 9, figs. 15-20). Carboniferous, upper and lower limestone, Glencart, Dalry, etc., west Scotland.
- Prioniodus undosus* ULRICH and BASSLER, 1926 (p. 12, pl. 1, figs. 18-20). Upper Devonian, Rhinestreet shale of Portage group, Shaletton, Erie County, N. Y.
- Prioniodus volborthii* PANDER, 1856. See *Prioniodina volborthii*.
- Prionognathus* PANDER, 1856 (p. 34); ULRICH and BASSLER, 1926 (p. 43). Genotype (only species): *Prionognathus brandtii*, Pander, 1856.
- Prionognathus brandtii* PANDER, 1856 (p. 34, pl. 4, fig. 19). Silurian, Root-sikülle, Island of Oesel. Probably not a conodont.
- Scolopodus* PANDER, 1856 (p. 25). Genotype (first species): *Scolopodus sublaevis* Pander, 1856.
- Scolopodus aequilateralis* PANDER, 1856 (p. 26, pl. 2, fig. 5). Lower Ordovician, Baltic Provinces.
- Scolopodus costatus* PANDER, 1856 (p. 26, pl. 2, fig. 7). Lower Ordovician, Baltic Provinces.
- Scolopodus quadratus* PANDER, 1856 (p. 26, pl. 2, fig. 6). Lower Ordovician, Baltic Provinces.
- Scolopodus semicostatus* PANDER, 1856 (p. 26, pl. 2, fig. 4). Lower Ordovician, Baltic Provinces.

- Scolopodus striatus* PANDER, 1856 (p. 26, pl. 2, fig. 8). Lower Ordovician, Baltic Provinces.
- Scolopodus sublaevis* PANDER, 1856 (p. 25, pl. 2, fig. 3). Lower Ordovician, Baltic Province.
- Subprioniodus* SMITH, 1907 (p. 247). Genotype: *Subprioniodus paucidentatus* Smith, 1907. Genus retained provisionally for Ordovician species of *Prioniodus* referred here by Smith.
- Subprioniodus acutus* SMITH, 1907 (p. 250, pl. 9, fig. 45; pl. 7, fig. 33). Ordovician, Arenig-Llandeilo, southern uplands of Scotland.
- Subprioniodus calcarus* SMITH, 1907 (p. 250, pl. 9, fig. 46). Ordovician, Arenig-Llandeilo, southern uplands of Scotland.
- Subprioniodus crassus* SMITH, 1907 (p. 250, pl. 9, fig. 48). Ordovician, Arenig-Llandeilo, southern uplands of Scotland.
- Subprioniodus cringcrampensis* SMITH, 1907 (p. 248, pl. 7, fig. 35). Ordovician, Arenig-Llandeilo, southern uplands of Scotland.
- Subprioniodus distans* SMITH, 1907 (p. 250, pl. 9, fig. 44). Ordovician, Arenig-Llandeilo, southern uplands of Scotland.
- Subprioniodus equalis* SMITH, 1907 (p. 248, pl. 7, fig. 31). Ordovician, Arenig-Llandeilo, southern uplands of Scotland.
- Subprioniodus falcatus* SMITH, 1907 (p. 250, pl. 9, fig. 51). Ordovician, Arenig-Llandeilo, southern uplands of Scotland.
- Subprioniodus fardingensis* SMITH, 1907 (p. 250, pl. 9, fig. 47). Ordovician, Arenig-Llandeilo, southern uplands of Scotland.
- Subprioniodus furcatus* SMITH, 1907 (p. 247, pl. 6, fig. 22). Ordovician, Arenig-Llandeilo, southern uplands of Scotland.
- Subprioniodus gibbosus* SMITH, 1907 (p. 247, pl. 7, fig. 27). Ordovician, Arenig-Llandeilo, southern uplands of Scotland.
- Subprioniodus huntlawensis* SMITH, 1907 (p. 248, pl. 7, fig. 34 a, b). Ordovician, Arenig-Llandeilo, southern uplands of Scotland.
- Subprioniodus lanceolatus* SMITH, 1907 (p. 247, pl. 7, fig. 29). Ordovician, Arenig-Llandeilo, southern uplands of Scotland.
- Subprioniodus obliquo-lanceolatus* SMITH, 1907 (p. 248, pl. 7, fig. 30). Ordovician, Arenig-Llandeilo, southern uplands of Scotland.
- Subprioniodus parvus* SMITH, 1907 (p. 247, pl. 7, figs. 26, 28). Ordovician, Arenig-Llandeilo, southern uplands, of Scotland.
- Subprioniodus paucidentatus* SMITH, 1907 (p. 247, pl. 6, fig. 21). Ordovician, Arenig-Llandeilo, southern uplands, of Scotland.
- Subprioniodus peracutus* SMITH, 1907 (p. 248, pl. 7, fig. 32). Ordovician, Arenig-Llandeilo, southern uplands of Scotland.
- Subprioniodus subserratus* SMITH, 1907 (p. 250, pl. 9, fig. 43). Ordovician, Arenig-Llandeilo, southern uplands, of Scotland.
- Synprioniodina* ULRICH and BASSLER, 1926 (p. 42). Genotype: *Synprioniodina alternata* Ulrich and Bassler, 1926.
- Synprioniodina alternata* ULRICH and BASSLER, 1926 (p. 42, text fig. 22). Mississippian, Chattanooga shale, 13 miles east of north of Huntsville, Ala.
- Synprioniodina nasuta* HINDE, 1879. *Polygnathus nasutus* HINDE, 1879 (p. 364, pl. 16, fig. 22); GRABAU, 1899 (p. 155, fig. 35). *Prioniodus nasutus* (Hinde) BRYANT, 1921 (p. 19). Devonian, Genesee shales, North Evans, Eighteen Mile Creek, N. Y.
- Valentia* SMITH, 1907 (p. 251); ULRICH and BASSLER, 1926 (p. 43). Genotype (only species): *Valentia morrochensis* SMITH, 1907.
- Valentia morrochensis* SMITH, 1907 (p. 257, pl. 9, fig. 50). Ordovician, Arenig-Llandeilo, southern uplands of Scotland.

## DESCRIPTION OF EARLY MISSISSIPPIAN SPECIES

All of the species herein described were obtained in the Chattanooga black shale of Early Mississippian age at a locality 13 miles east of north of Huntsville, Ala.

## Family PRIONIODIDAE Ulrich and Bassler, 1926

## Genus PRIONIODUS (Hinde) Bryant, 1921

## PRIONIODUS ALABAMENSIS, new species

Plate 9, figs. 1, 2

Tooth consisting of a long, thin, tapering, recurved cusp rising from a flat, thick bar. This central cusp is not produced below the base. A series of short, sharp pointed denticles which are well separated, rises at an acute angle from the bar.

*Cotypes*.—Cat. No. 11431, U.S.N.M.

## PRIONIODUS ALATOIDES, new species

Plate 9, fig. 3

This is a more delicate species than Hinde's *Prioniodus alatus*. The bar is straight, flat, and thin. The cusp is very wide at the base but tapers to a sharp point, extends below and forms an obtuse angle with the bar. The denticles and the cusp rise from the bar at obtuse angles.

*Holotype*.—Cat. No. 11432, U.S.N.M.

## PRIONIODUS CULTRATUS Ulrich and Bassler, 1926

Plate 9, fig. 4

1926. *Prioniodus cultratus* ULRICH and BASSLER, Proc. U. S. Nat. Mus., vol. 68, art. 12, p. 9, pl. 9, fig. 7.

Tooth composed of a broad, flat, tapering cusp rising from the slightly deflected end of a moderately flat bar at a right angle. Four long, sharp pointed, slightly recurved denticles are placed on the bar at obtuse angles with the base of the cusp. These are succeeded by several short, smaller denticles.

*Plesiotype*.—Cat. No. 11433, U.S.N.M.

## Genus LIGONODINA Ulrich and Bassler, 1926

## LIGONODINA PARVULA, new species

Plate 9, fig. 5

The pointed, recurved cusp extends below a slightly curved bar on which are several denticles, well rounded and set at obtuse angles to

the bar. A wide space separates the cusp and the denticles, which in turn are removed from one another by means of a space about equal to the width of a denticle. The characteristic suckerlike markings are present on the downward extension of the main cusp.

*Holotype*.—Cat. No. 11434, U.S.N.M.

Family PRIONIODINIDAE Ulrich and Bassler, 1926

Genus HINDEODELLA Ulrich and Bassler, 1926

HINDEODELLA TENERRIMA, new species

Plate 9, figs. 6, 7

A long, thin, sharp pointed cusp rises from a very slender bar. Two broken denticles are on one side of the cusp and nine or ten are on the other side, all widely spaced. Due to the concavity of the bar immediately below the cusp, it may be inferred that this is the inner side of the jaw.

*Cotypes*.—Cat. No. 11435, U.S.N.M.

HINDEODELLA MINUTIDENS, new species

Plate 9, fig. 8

The upright denticles in this specimen are so minute and regularly, though closely, spaced and the bar is so long and flat that this conodont resembles a fine-toothed saw.

*Holotype*.—Cat. No. 11436, U.S.N.M.

HINDEODELLA GERMANA, new species

Plate 9, fig. 9

The anterior side of the bar is very thick and bears several needle-like, irregular denticles. On the posterior side the denticles, which slant backward, are alternately long and short. In one or two places two small denticles are found between the longer ones. The posterior end of the bar terminates in a spinelike point.

*Holotype*.—Cat. No. 11437, U.S.N.M.

HINDEODELLA SUBTILIS Ulrich and Bassler

Plate 9, figs. 10, 11

1926. *Hindeodella subtilis* ULRICH and BASSLER, Proc. U. S. Nat. Mus., vol. 68, art. 12, p. 39, pl. 8, figs. 17-19.

This species, described from the Hardin sandstone, is well represented in the succeeding Chattanooga black shale, where entire specimens, such as those in Figure 10, are not uncommon. The characteristic basketlike expansion at the anterior end and the minuteness and decided alternation of the denticles along the bar are features easily

recognized. Figure 11 represents a variety in which the alternation of the denticles is not so evident and the denticles are shorter.

*Plesiotypes*.—Cat. No. 11438, U.S.N.M.

Genus **LONCHODINA** Ulrich and Bassler, 1926

**LONCHODINA IRREGULARIS**, new species

Plate 9, fig. 12

Bar slightly outwardly bowed, irregularly curved, with the anterior end shorter and bent abruptly downward. Main cusp located at the point of downward bending, followed posteriorly by two equally large denticles separated by a minute one. Rest of bar occupied by narrow, more delicate denticles decreasing in size to the extremities. The irregularity of curvature and the three larger central denticles characterize this species.

*Holotype*.—Cat. No. 11439, U.S.N.M.

**LONCHODINA DISCRETA** Ulrich and Bassler

Plate 9, fig. 13

1926. *Lonchodina discreta* ULRICH and BASSLER, Proc. U. S. Nat. Mus., vol. 18, p. 36, pl. 10, figs. 1, 2.

A pointed, short, robust cusp rises from an irregularly curved, narrow bar. The cusp is separated from the denticles on each side by spaces several times its diameter. The two denticles on one side of the bar are short and robust; on the other side there are three which are thin.

*Plesiotype*.—Cat. No. 11440, U.S.N.M.

Genus **PRIONIODELLA** Ulrich and Bassler, 1926

**PRIONIODELLA ARCUATA**, new species

Plate 9, fig. 14

Tooth minute, broadly arched, the bar of which is very narrow, but well rounded. Denticles all similar, being delicate and needle-like, but the long ones are grouped on the anterior part of the bar and the short ones on the posterior. The decided curvature of the bar, the absence of a main cusp, and the two sets of delicate denticles characterize this species.

*Holotype*.—Cat. No. 11441, U.S.N.M.

**PRIONIODELLA INUTILIS**, new species

Plate 9, fig. 15

Bar broad, very slightly curved, bearing closely arranged, but distinctly separated denticles rather equal in size.

*Holotype*.—Cat. No. 11442, U.S.N.M.

## Genus PRIONIODINA Ulrich and Bassler, 1926

## PRIONIODINA SEPARANS, new species

Plate 9, figs. 16, 17

Tooth consisting of a slender curved bar bearing fourteen or more rather short, flattened denticles, separated from each other by more than their own diameter and with a main cusp about twice the size of a denticle, developed at the angle of curvature. The cusp is slightly extended below the bar into a protuberance. The denticles are very similar to each other and to the cusp in shape.

*Cotypes*.—Cat. No. 11443, U.S.N.M.

## PRIONIODINA UNDULATA, new species

Plate 9, fig. 18

This bar is slightly arched along the posterior extension, but is sharply deflected at the cusp, forming a right angle. The main cusp is very long, stout, well rounded, and bluntly pointed. The denticles on both sides are similar to the cusp but they are about one-third the size and they vary somewhat as to length. The denticles farthest from the cusp are upright but the nearer they approach the cusp, the more they bend toward this great central tooth. A space a little less than the width of the denticles separates them.

*Holotype*.—Cat. No. 11444, U.S.N.M.

## Genus BRYANTODUS Ulrich and Bassler, 1926

## BRYANTODUS INEQUALIS, new species

Plate 10, figs. 1, 2

The bar is traversed for half its length by a median ridge. The other half is very flat, curling slightly at the end. A broad, short, sharply pointed, and slightly recurved cusp rises at an obtuse angle from the center of the bar. The cusp is about four times as broad as the denticles at its base. Posterior to the main cusp the denticles are short and slightly separated. On the anterior side the denticles are about twice this length, although they gradually become shorter as they approach the end of the bar. As the denticles become shorter they are at right angles with the bar, whereas the long ones near the cusp are noticeably curved toward that tooth.

The unequal size of the two sets of denticles marks this species.

*Cotypes*.—Cat. No. 11445, U.S.N.M.

## BRYANTODUS INCLINATUS, new species

Plate 10, fig. 3

Tooth triangular in outline, consisting of a broad flat sharp pointed main cusp, inclined to the bar, followed posteriorly by at least 10

slender denticles diminishing in size toward the extremity and anteriorly by three or four similar denticles. All of the denticles are also blunt and are very much alike except in length. All are inclined with the main cusp.

The strong inclination of both main cusp and denticles characterize this species.

*Holotype*.—Cat. No. 11446, U.S.N.M.

**BRYANTODUS GERMANUS, new species**

Plate 10, fig. 5

The wide, almost flat bar is traversed for its entire length by a median line. The upper and lower portions of the bar thus lie in two different planes. From the center of the upper half a broad angled and strongly recurved tooth rises. On the concave side of this cusp there is a broad, blunt denticle about as long as the cusp. The other denticles vary in length but are of the same general shape. On the other side of the cusp the denticles are longer, flatter, and very sharp pointed. Narrow but equal spaces separate all of the denticles.

*Holotype*.—Cat. No. 11447, U.S.N.M.

**BRYANTODUS SUBANGULATUS, new species**

Plate 10, fig. 6

This narrow bar is very strongly arched or angulated. On one side of the cusp the denticles are much shorter than those on the other side. All of the denticles become gradually shorter toward the ends of the bar.

*Holotype*.—Cat. No. 11448, U.S.N.M.

**Genus EUPRIONIODINA Ulrich and Bassler, 1926**

**EUPRIONIODINA GERMANA, new species**

Plate 10, fig. 7

The moderately arched bar is broad and angulated on one side of the cusp. On the other side it is stout but somewhat flat. Broad, heavy denticles rise from the long side of the bar. The terminal denticle is about as broad as any two of the others. All of the denticles are separated by very narrow spaces. There is a wide space on each side of the cusp which is round, very thick, and slightly extended below the bar. On the short side of the bar the denticles are thinner than the others but they are quite substantial looking. They are short and widely spaced.

*Holotype*.—Cat. No. 11449, U.S.N.M.

Genus **DIPLODODELLA** Ulrich and Bassler, 1926**DIPLODODELLA BILATERALIS** Ulrich and Bassler, 1926

Plate 10, fig. 8

1926. *Diplododella bilateralis* ULRICH and BASSLER, Proc. U. S. Nat. Mus., vol. 68, p. 41, text, fig. 21.

The short, narrow, blunt cusp rises from the center of a strongly arched bar, both sides of which are about equal in length. The median ridge, extending the whole length of the bar, divides the bar into two parts which lie in different planes. Beneath the cusp there is a small concave depression. The denticles, which are alike on both sides of the cusp, seem to rise from the median ridge rather than from the edge of the bar. Spaces wider than the denticles separate them. The denticles themselves vary in size; the nearer the ends of the bar, the smaller and thinner they become.

*Holotype*.—Cat. No. 11306, U.S.N.M.

Genus **HIBBARDELLA** Ulrich and Bassler, 1926**HIBBARDELLA CURVATA**, new species

Plate 10, fig. 9

This is a tiaralike tooth. There are five short, thick denticles with blunt points on each side of a narrow but very robust bar. Very wide spaces separate the denticles. The crownlike appearance is helped by the curved contour of the strongly arched bar. The blunt-pointed cusp is very wide, thick, and long.

*Holotype*.—Cat. No. 11450, U.S.N.M.

Genus **PALMATODELLA** Ulrich and Bassler, 1926**PALMATODELLA DELICATULA** Ulrich and Bassler, 1926

Plate 10, fig. 10

1926. *Palmatodella delicatula* ULRICH and BASSLER, Proc. U. S. Nat. Mus., vol. 68, p. 4, pl. 10, fig. 5, text fig. 20.

This sharply arched bar is distinctly divided into two parts. On one side of the long, angular cusp which has its origin in the peak of the bar, the round, thick bar bears a number of short, sharp-pointed and well-separated denticles. The other side has the appearance of a flat, finely serrated palm leaf. Here the denticles gradually diminish in length from the very long one next to the cusp to the one at the end of the bar which is so minute as to be hardly distinguished from the bar itself. Spaces about the width of very fine hairs separate these denticles.

*Holotype*.—Cat. No. 11307, U.S.N.M.

Genus *SYNPRIONIODINA* Ulrich and Bassler, 1926*SYNPRIONIODINA ALTERNATA* Ulrich and Bassler, 1926

Plate 10, figs. 11, 12

1926. *Synprioniodina alternata* ULRICH and BASSLER, Proc. U. S. Nat. Mus., vol. 68, p. 42, text, fig. 22.

Both of these specimens exhibit the interior sides of two opposite plates. The long, stout cusp, tapering to a very blunt point, divides the bar into two unequal parts. The denticles are merely indicated on the short side of the sharply arched bar. The long side bears a number of long, needlelike denticles. In some places the relatively wide spaces between the denticles are filled with very fine denticles. In Figure 11 the denticles are much longer than those in Figure 12.

*Holotype and plesiotype*.—Cat. No. 11308, U.S.N.M.

*SYNPRIONIODINA PLANA*, new species

Plate 10, fig. 13

The bar is very broad, flat, and strongly arched. A median ridge divides the bar into two parts. The cusp is flat, very wide, and tapers a little toward a rather wide, blunt point. It is about twice the length of the other denticles, which are similar in shape. The spaces become wider as both ends of the bar are approached. All of the denticles are set at right angles to the bar, which is very long on the steeper side of the arch. This specimen, as well as several others the bars of which are divided by the median ridge, gives one the impression of being one of a series, set in a jaw, as the shark's teeth are.

*Holotype*.—Cat. No. 11451, U.S.N.M.

## Family POLYGNATHIDAE Ulrich and Bassler, 1926

Genus *PANDERODELLA* Ulrich and Bassler, 1926*PANDERODELLA RECTA*, new species

Plate 10, fig. 14

Our figure shows the convex side of the plate or tooth, the bar of which is very flat and broad. The cusp, which is scarcely different from the other short, blunt pointed denticles, is moderately produced as a flange below the bar. These denticles are all widely separated. The terminal tooth of the long side helps to form a convex end to the bar.

*Holotype*.—Cat. No. 11452, U.S.N.M.

**PANDERODELLA SUBRECTA**, new species

Plate 10, fig. 15

This specimen is a modification of *Panderodella recta*. The deflection of the bar is more noticeable. The denticles on the long side of the bar are short, spear-shaped, and evenly spaced. Those on the deflected side are needlelike.

*Holotype*.—Cat. No. 11453, U.S.N.M.

**Genus POLYGNATHUS (Hinde) Bryant, 1921****POLYGNATHUS GYRATILINEATUS**, new species

Plate 11, figs. 1, 2

Plate an irregular polygon with the tubercles united so as to form parallel ridges extending in concentric lines from one side of the median ridge to a place on the other side directly opposite the point of origin. The median ridge, which is slightly flexed to the right and to the left, is produced beyond the plate into a carina bearing denticles.

*Cotypes*.—Cat. No. 11454, U.S.N.M.

**POLYGNATHUS PERGYRATUS**, new species

Plate 11, fig. 3

This species is very similar to *Polygnathus gyratilineatus* but the lines are much closer together. The posterior end of the plate is produced into a carina as usual in this type of species.

*Holotype*.—Cat. No. 11455, U.S.N.M.

**POLYGNATHUS TRILOBATUS**, new species

Plate 11, fig. 4

As its name indicates this is a distinctly three-lobed plate. The anterior lobe is long and narrow, while the lateral lobes sweep in broad lines from the anterior lobe to the carina. A low median ridge rises in the middle of the anterior lobe becoming flattened towards the top but gradually narrowing posteriorly until it is produced beyond the plate into a broad carina, bearing denticles. The tubercles of the basal portion are stronger and more concentrically arranged than in *Polygnathus concentricus*. The tubercles of the anterior lobe extend from side to side across the top of the median ridge.

*Holotype*.—Cat. No. 11456, U.S.N.M.

## POLYGNATHUS CONCENTRICUS Ulrich and Bassler, 1926

Plate 11, figs. 5-7

1926. *Polygnathus concentricus* ULRICH and BASSLER, Proc. U. S. Nat. Mus., vol. 68, p. 47, pl. 8, figs. 6, 7.

The plate is roughly triangular, having three well-defined lobes. The rounded lateral lobes gradually disappear into the sides of the sharp-pointed anterior lobe by means of a shallow, curving indentation. The plate is slightly depressed toward the posterior end but elevated in the anterior lobe. The median ridge, which is low but sharp in the posterior end, extends the entire length of the plate and in the anterior lobe becomes broad, being produced beyond the plate by a carina bearing several round, compressed denticles. Both the median ridge and the carina are somewhat sinuous in their courses. Short tubercles are concentrically arranged in the lobes. In the anterior lobe, where they cross the median ridge, they are so closely spaced as to appear as continuous lines. Compared with *Polygnathus trilobatus*, this species differs in its more finely marked basal portion and in the extension of the median ridge to the anterior extremity.

*Plesiotypes*.—Cat. No. 11457, U.S.N.M.

## POLYGNATHUS RHOMBOIDEUS Ulrich and Bassler

Plate 11, figs. 11, 12

1926. *Polygnathus rhomboideus* ULRICH and BASSLER, Proc. U. S. Nat. Mus., vol. 68, p. 46, pl. 7, fig. 6.

Plate rhomboidal in shape. Posterior lobe long and narrow. Lateral lobes slightly broader and somewhat rounded. The median ridge which extends the length of the plate is extended beyond the plate by a short, narrow carina, bearing several denticles, varying in shape and size. These denticles are extensions of those borne on the median ridge. In the anterior end of the plate the ridge is traversed by tubercles concentrically arranged but terminating abruptly at the ill-defined base of the ridge. Parallel rows of denticles extend from the anterior lobe to the origin of the carina, where they turn at a sharp angle and terminate in the margin of the lateral lobes.

The rhomboidal shape, less conspicuous transverse ribs, fewer rows of tubercles, and their more longitudinal arrangement, distinguish this species from its allies such as *Polygnathus concentricus*.

*Plesiotypes*.—Cat. No. 11456, U.S.N.M.

## POLYGNATHUS PENNATULOIDEA, new species

Plate 11, fig. 14

This species is somewhat similar to *Polygnathus pennatulus* Ulrich and Bassler. The high median ridge is surmounted by

numerous tubercles. It extends the whole length of the plate, beyond which it is produced by means of a long, robust carina, bearing several large denticles. The tubercles on the plate are arranged in less definite order than in *P. pennatulus*.

*Holotype*.—Cat. No. 11, 461, U.S.N.M.

**POLYGNATHUS PENNATULUS** Ulrich and Bassler

Plate 11, fig. 15

1926. *Polygnathus pennatulus* ULRICH and BASSLER, Proc. U. S. Nat. Mus., vol. 68, p. 45, pl. 7, fig. 8; pl. 9, figs. 24, 25.

The narrow median ridge which bears denticles throughout its length extends from the anterior end of the plate to the carina, which is slightly deflected. Several stout denticles are borne on the carina. The tubercles on both sides of the plate occur in short parallel lines extending from the margin to a depression at the base of the ridge.

*Plesiotype*.—No. 11, 462, U.S.N.M.

**Genus PALMATOLEPIS** Ulrich and Bassler, 1926

**PALMATOLEPIS INEQUALIS**, new species

Plate 11, figs. 8-10

This plate is divided into three parts by the unequal bifurcations of the median ridge. The main part of the ridge which is produced beyond the plate by a short, blunt carina, is broad and stout. The branches which are thin and high bear six or seven denticles. The short, blunt tubercles on each section of the plate are generally arranged at right angles to the main ridge or its branches. Figure 10 is the under surface of plate with the same bifurcated ridges but without ornament.

*Cotypes*.—Cat. No. 11, 458, U.S.N.M.

**PALMATOLEPIS ELONGATA**, new species

Plate 11, fig. 13

This is a long, narrow, minute plate with the finely denticulated median ridge extending its whole length. The ridge is very low at the anterior end but rises toward the posterior end where it becomes high and broad. On one side of the plate there is a short, pointed lobe. The relative smoothness of the surface serves to distinguish this species from *Palmatolepis perlobata* Ulrich and Bassler to which it is related.

*Holotype*.—Cat. No. 11, 460, U.S.N.M.

## PALMATOLEPIS PERLOBATUS Ulrich and Bassler

Plate 11, figs. 16-19

1926. *Palmatolepis perlobatus* ULRICH and BASSLER, Proc. U. S. Nat. Mus., vol. 68, p. 49, pl. 7, figs. 19-23.

Plate irregularly diamond shaped, flexed either to the right or to the left in the posterior portion. The ridge extends the whole length of the plate and is slightly produced beyond by a short, thick carina. The anterior portion of the ridge is indicated by a low, narrow line. From a central prominence the ridge thickens toward the carina. One side, which is rounded, extends slightly beyond the center. The other side which is produced in the central region by an angular lobe extends almost the entire length of the median ridge but becomes gradually narrower as it approaches the carina. In the anterior lobe the short, blunt tubercles converge toward the central prominence. This in the posterior half of the plate are at right angles to the central ridge.

*Plesiotype*.—Cat. No. 11, 463, U.S.N.M.

## EXPLANATION OF PLATES

## PLATE 1

All of the figures on this and the following seven plates are copied from the authors cited. The magnification was often not stated but it lies usually between 10 and 20 diameters.

- FIG. 1. *Distacodus (Machairodus) angustus* Pander, 1856.  
 2. *Distacodus (Machairodus) canaliculatus* Pander, 1856.  
 3, 4. *Distacodus (Machairodus) dilatatus* Pander, 1856.  
 5-9. *Distacodus (Machairodus) ensiformis* Pander, 1856.  
 10. *Distacodus (Machairodus) inaequalis* Pander, 1856.  
 11. *Distacodus (Machairodus) incurvus* Pander, 1856.  
 12. *Distacodus incurvus* (Pander) Hinde, 1879.  
 13. *Distacodus (Machairodus) planus* Pander, 1856.  
 14. *Distacodus (Machairodia) rhombeus* (Pander) Smith, 1907.  
 15. *Distacodus (Machairodia) sulcata* Smith, 1907.  
 16. *Belodus gracilis* Pander, 1856.  
 17. *Distacodus (Machairodus) rhomboideus* Pander, 1856.  
 18. *Distacodus (Machairodus) rhomboideus* Pander, 1856, var.  
 19. *Distacodus (Machairodus) solidus* Pander, 1856.  
 20. *Acodus acutus* Pander, 1856.  
 21, 22. *Acodus crassus* Pander, 1856.  
 23. *Acodus erectus* Pander, 1856.  
 24. *Acodus planus* Pander, 1856.  
 25. *Acodus sigmoideus* Pander, 1856.  
 26. *Acontiodus gracilis* Pander, 1856.  
 27. *Acontiodus latus* Pander, 1956.  
 28. *Acontiodus triangularis* Pander, 1856.  
 29. *Drepanodus acutus* Pander, 1856.  
 30-35. *Drepanodus arcuatus* Pander, 1856.  
 36, 37. *Drepanodus arcuatus* (Pander) Hinde, 1879.  
 38. *Drepanodus falcatus* Hadding, 1913.  
 39-41. *Drepanodus flexuosus* Pander, 1856.  
 42. *Drepanodus inflexus* Pander, 1856.

## PLATE 2

- FIG. 1. *Drepanodus flexuosus* (Pander) Smith, 1907.  
 2. *Drepanodus inflexus* Pander, 1856.  
 3. *Drepanodus obtusus* Pander, 1856.  
 4. *Drepanodus robustus* Hadding, 1913.  
 5. *Drepanodus verutus* Hadding, 1913.  
 6. *Scolopodus aequilateralis* Pander, 1856.  
 7. *Scolopodus costatus* Pander, 1856.  
 8. *Scolopodus quadratus* Pander, 1856.  
 9. *Scolopodus semicostatus* Pander, 1856.  
 10. *Scolopodus striatus* Pander, 1856.  
 11. *Scolopodus sublaevis* Pander, 1856.  
 12. *Oistodus parallelus* Pander, 1856.  
 13. *Oistodus inaequalis* Pander, 1856.  
 14. *Oistodus acuminatus* Pander, 1856.  
 15-17. *Oistodus lanceolatus* Pander, 1856.  
 18. *Paltodus bicostatus* Pander, 1856.  
 19. *Paltodus canaliculatus* Pander, 1856.  
 20, 21. *Paltodus rotundatus* Pander, 1856.  
 22-25. *Paltodus obtusus* Pander, 1856.  
 26. *Paltodus subaequalis* Pander, 1856.  
 27-29. *Paltodus truncatus* Pander, 1856.

## PLATE 3

- FIG. 1. *Prioniodus sulcatus* Pander, 1856.  
 2. *Prioniodus carinatus* Pander, 1856.  
 3. *Prioniodus alternans* Hadding, 1913.  
 4-6. *Prioniodus elegans* Pander, 1856.  
 7. *Prioniodus elegans* (Pander) Hinde, 1879.  
 8. *Prioniodus abbreviatus* Hinde, 1879.  
 9, 10. *Prioniodus armatus* Hinde, 1879.  
 11-13. *Prioniodus spicatus* Hinde, 1879.  
 14. *Prioniodus spicatus* Hinde, 1900.  
 15. *Prioniodus spicatus* (Hinde) Clarke, 1886.  
 16-19. *Prioniodus tulensis* Pander, 1856.  
 20-22. *Prioniodus tulensis* (Pander) Hinde, 1900.  
 23, 24. *Prioniodus equalis* Smith, 1907.  
 25. *Prioniodus inflatus* Smith, 1907.  
 26. *Prioniodus porcatus* Hinde, 1900.  
 27. *Prioniodus lelaps* T. H. Clark, 1924.  
 28, 29. *Prioniodus macconochii* Smith, 1907.  
 30. *Prioniodus tigris* T. H. Clark, 1924.  
 31. *Prioniodus pamphagus* T. H. Clark, 1924.  
 32. *Prioniodus complex* Hinde, 1900.  
 33. *Prioniodus dorcens* T. H. Clark, 1924.  
 34. *Prioniodus (Polygnathus) pauperatus* Smith, 1907.  
 35. *Prioniodus subcompactus* Smith, 1907.  
 36. *Prioniodus melampus* T. H. Clark, 1924.  
 37-39. *Prioniodus peracutus* Hinde, 1900.  
 40. *Prioniodus alatus* Hinde, 1879.

## PLATE 4

- FIG. 1. *Subprioniodus subseratus* Smith, 1907.  
 2. *Subprioniodus calcarus* Smith, 1907.  
 3-5. *Subprioniodus acutus* Smith, 1907.  
 6. *Subprioniodus crassus* Smith, 1907.  
 7. *Subprioniodus distans* Smith, 1907.  
 8. *Subprioniodus cringcampensis* Smith, 1907.  
 9. *Subprioniodus equalis* Smith, 1907.  
 10. *Subprioniodus falcatus* Smith, 1907.  
 11. *Subprioniodus furcatus* Smith, 1907.  
 12. *Subprioniodus fardingensis* Smith, 1907.  
 13. *Subprioniodus gibbosus* Smith, 1907.  
 14, 15. *Subprioniodus huntlaurensis* Smith, 1907.  
 16. *Subprioniodus lanceolatus* Smith, 1907.  
 17. *Subprioniodus obliquo-lanceolatus* Smith, 1907.  
 18, 19. *Subprioniodus parvus* Smith, 1907.  
 20, 21. *Subprioniodus paucidentatus* Smith, 1907.  
 22. *Subprioniodus peracutus* Smith, 1907.  
 23-29. *Cordylodus angulatus* Pander, 1856.  
 30. *Cordylodus ramosus* Hadding, 1913.  
 31, 32. *Cordylodus rotundatus* Pander, 1856.  
 33. *Cornuramia bicornua* Smith, 1907.  
 34. *Cornuramia diplodonta* Smith, 1907.  
 35. *Cornuramia monodonta* Smith, 1907.  
 36. *Hindeodella (Polygnathus) dubius* (Hinde) Smith, 1907.  
 37, 38. *Hindeodella (Centroodus) duplicatus* Pander, 1856.  
 39. *Hindeodella (Centroodus) duplicatus* (Pander) Hinde, 1879.  
 40, 41. *Hindeodella (Centroodus) lineatus* (Pander) Hinde, 1879.  
 42. *Hindeodella (Centroodus) lineatus* Pander, 1856.  
 43. *Ligonodina (Prioniodus) panderi* Hinde, 1879.  
 44. *Prioniodus theron* T. H. Clark, 1924.

## PLATE 5

- FIGS. 1, 2. *Hindeodella (Ctenognathus) obliquus* Pander, 1856.  
 3-5. *Hindeodella (Ctenognathus) obliquus* (Pander) Hinde, 1879.  
 6. *Pachysomia waulöckensis* Smith, 1907.  
 7. *Lonchodina (Polygnathus) spinata* Hadding, 1913.  
 8. *Lonchodina (Prioniodus) erraticus* Hinde, 1879.  
 9. *Lonchodina (Prioniodus) clavatus* Hinde, 1879.  
 10. *Prioniodina (Prioniodus) geminus* Hinde, 1879.  
 11. *Prioniodina (Prioniodus) volborthii* Pander, 1856.  
 12. *Bryantodus (Polygnathus) radiatus* Hinde, 1879.  
 13. *Bryantodus (Polygnathus) duplicatus* Hinde, 1879.  
 14. *Bryantodus (Polygnathus) immersus* Hinde, 1879.  
 15, 16. *Bryantodus (Prioniodus) politus* Hinde, 1879.  
 17, 18. *Euprioniodina (Prioniodus) alata* Hadding, 1913.  
 19. *Euprioniodina (Prioniodus) discedens* Hadding, 1913.  
 20, 21. *Euprioniodina (Prioniodus) acicularis* Hinde, 1879.  
 22. *Euprioniodina (Polygnathus) lanceolata* Smith, 1907.  
 23. *Euprioniodina (Prioniodus) furcata* Hinde, 1879.  
 24-29. *Euprioniodina (Prioniodus) radicans* Hinde, 1879.  
 30. *Euprioniodina (Prioniodus) curvata* Smith, 1907.  
 31. *Hibbardella (Prioniodus) angulatus* Hinde, 1879.  
 32, 33. *Hibbardella (Prioniodus) angulatus* Hinde, 1900.

## PLATE 6

- FIG. 1. *Lonchodus* (*Polygnathus*) *parvus* Smith, 1907.  
 2-5. *Lonchodus* (*Centroodus*) *simplex* Pander, 1856.  
 6. *Lonchodus* (*Centroodus*) *obliquus* Smith, 1907.  
 7-10. *Lonchodus* (*Centroodus*) *erectus* Smith, 1907.  
 11. *Lonchodus* (*Centroodus*) *convexus* Pander, 1856.  
 12-14. *Lonchodus* (*Polygnathus*) *convexus* (Pander) Hinde, 1900.  
 15. *Lonchodus* (*Centroodus*) *distans* Smith, 1907.  
 16. *Lonchodus* (*Polygnathus*) *princeps* Hinde, 1879.  
 17-20. *Lonchodus* (*Polygnathus*) *princeps* (Hinde) Smith, 1907.  
 21. *Lonchodus* (*Polygnathus*) *curvatus* Smith, 1907.  
 22. *Lonchodus* (*Polygnathus*) *coronatus* Hinde, 1879.  
 23. *Lonchodus* (*Polygnathus*) *minus* Smith, 1907.  
 24. *Valentia morrochensis* Smith, 1907.  
 25. *Panderodella* (*Polygnathus*) *solidus* Hinde, 1879.  
 26-28. *Panderodella* (*Polygnathus*) *scitulus* Hinde, 1900.  
 29, 30. *Panderodella* (*Polygnathus*) *serratus* Hinde, 1879.  
 31. *Gnathodus mosquensis* Pander, 1856.  
 32. *Gnathodus* (*Polygnathus*) *crassus* Hinde, 1879.  
 33. *Gnathodus* (*Polygnathus*) *curvatus* Hinde, 1879.  
 34, 35. *Prionognathus brandtii*, Pander, 1856.

## PLATE 7

- FIG. 1. *Gnathodus* (*Polygnathus*) *ericensis* Hinde, 1879. (Side view.)  
 2-4. *Polygnathus* (*Gnathodus*) *mosquensis* (Pander) Hinde, 1900.  
 5. *Polygnathus* ? *simplex* Hinde, 1879.  
 6. *Polygnathus cristatus* (Hinde) Clarke, 1885.  
 7. *Polygnathus cristatus* Hinde, 1879.  
 8, 9. *Polygnathus cristatus* Hinde (*Polygnathus dubius*, part), 1879.  
 10, 11. *Polygnathus pennatus* Hinde, 1879.  
 12. *Polygnathus pennatus* (Hinde) Clarke, 1885.  
 13. *Polygnathus argos* T. H. Clark, 1924.  
 14. *Polygnathus navicula* Hinde, 1900.  
 15, 16. *Polygnathus palmatus* Hinde, 1879.  
 17. *Palmatalepis* (*Polygnathus*) *punctatus* Hinde, 1879.  
 18, 19. *Polygnathus tuberculatus* Hinde, 1879.  
 20, 21. *Polygnathus truncatus* Hinde, 1879.  
 22. *Polygnathus linguiformis* Hinde, 1879.  
 23. *Ctenognathus muchisoni* Pander, 1856.  
 24. *Ctenognathus keyserlingii* Pander, 1856.  
 25-29. *Ctenognathus verneuilli* Pander, 1956.  
 30. *Synprioniodina* (*Polygnathus*) *nasutus* Hinde, 1879.

## PLATE 8

- FIG. 1. *Prioniodina* (*Polygnathus*) *dubius* (Hinde) Smith, 1900. A species of *Bryantodus*.  
 2-13. *Polygnathus dubius* Hinde, 1879. Devonian (probably Portage) western New York. Specimens of different genera as follows, referred to this species: 2, 4, *Bryantodus*; 3, *Prioniodina*; 5, 8, *Hindcodella*; 7, *Gnathodus* or *Polygnathus*; 6, 9, 11, 12, *Lonchodus* or undetermined; 13, *Lonchodina*;  
 14-32. *Polygnathus dubius* (Hinde) Clarke, 1885. Specimens from the Naples shale at Naples, Ontario County, N. Y., referred by Clark in 1885 to this species. Genera represented as follows: 14-16, 19, 21, 22, side views of *Polygnathus*; 17, 25, *Bryantodus*; 18, *Prioniodus*; 20, 23, 24, *Lonchodus*; 26-28, 31, *Hindcodella*; 30, *Polygnathellus*; 29, 32, *Euprioniodina*.

## PLATE 9

All the specimens illustrated here and on plates 9 and 10 are from the Chattanooga black shale of Lower Mississippian age at a locality 13 miles east of north of Huntsville, Ala. All are magnified 12 diameters.

- FIGS. 1, 2. *Prioniodus alabamensis*, new species.  
 3. *Prioniodus alatoides*, new species.  
 4. *Prioniodus cultratus* Ulrich and Bassler.  
 5. *Ligonodina parvula*, new species.  
 6, 7. *Hindeodella tenerrima*, new species.  
 8. *Hindeodella minutidens*, new species.  
 9. *Hindeodella germana*, new species.  
 10, 11. *Hindeodella subtilis* Ulrich and Bassler.  
 12. *Lonchodina irregularis*, new species.  
 13. *Lonchodina discreta* Ulrich and Bassler.  
 14. *Prioniodella arcuata*, new species.  
 15. *Prioniodella inutilis*, new species.  
 16, 17. *Prioniodina separans*, new species.  
 18. *Prioniodina undulata*, new species.

## PLATE 10

Chattanooga black shale 13 miles east of north of Huntsville, Ala. Magnified 12 diameters.

- FIGS. 1, 2. *Bryantodus inequalis*, new species.  
 3. *Bryantodus inclinatus*, new species.  
 4. *Bryantodus*, species.  
 5. *Bryantodus germanus*, new species.  
 6. *Bryantodus subangulatus*, new species.  
 7. *Euprioniodina germana*, new species.  
 8. *Diplododella bilateralis* Ulrich and Bassler.  
 9. *Hibbardella curvata*, new species.  
 10. *Palmatodella delicatula* Ulrich and Bassler.  
 11, 12. *Synprioniodina alternata* Ulrich and Bassler.  
 13. *Synprioniodina plana*, new species.  
 14. *Panderodella recta*, new species.  
 15. *Panderodella subrecta*, new species.

## PLATE 11

Chattanooga black shale, 13 miles east of north of Huntsville, Ala. Magnified 12 diameters.

- FIGS. 1, 2. *Polygnathus gyratilineatus*, new species.  
 3. *Polygnathus pergyratus*, new species.  
 4. *Polygnathus trilobatus*, new species.  
 5-7. *Polygnathus concentricus* Ulrich and Bassler.  
 8-10. *Palmatolepis inequalis*, new species.  
 11, 12. *Polygnathus rhomboideus* Ulrich and Bassler.  
 13. *Palmatolepis elongatus*, new species.  
 14. *Polygnathus pennatuloideus*, new species.  
 15. *Polygnathus pennatulus* Ulrich and Bassler.  
 16-19. *Palmatolepis perlobatus* Ulrich and Bassler.